



REPUBLIC OF BOTSWANA

DEPARTMENT OF WATER AFFAIRS

REPORT ON THE 2014 WATER PITSO

VENUE: MAUN LODGE, MAUN

DATE: 20-21 MARCH 2014



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1.0 Introduction

The 2014 Water Pitso held at Maun Lodge, Maun from March 20th – 22nd 2014 was the third in a series of annual consultative forums convened by the Ministry of Minerals, Energy and Water Resources (MMEWR) that started in 2011 with the Pitso in Selibe Phikwe which was held under the theme: *Water for the people and development: Key priorities and challenges*. This was followed by the second Pitso which was held in Mahalapye in 2012 under the theme: *Options for Sustainable Water provision for agricultural use: Key drivers for poverty eradication*. The theme for the 2014 Pitso was: *Sustainable interventions to address Botswana water challenges*.

As with the other two, the 2014 Pitso was convened to provide a forum for consultation on issues of importance in water resources management in Botswana. These included amongst others the need to integrate water resources management into development planning, mainstreaming climate change and promoting the participation of a broad spectrum of stakeholders including community groups in the decision making processes affecting water resources management.

The 2014 Pitso was attended by one hundred and forty participants representing almost all branches of government, the private sector, civil society organizations and community leaders. The representation at the Pitso was broader than was the case at the other two meetings. This was in response to the need to involve a diverse spread of stakeholders as possible in the deliberations.

Day 1 of the Pitso was divided into two sessions with two masters of ceremonies. Session one was the official opening session followed by reflection on the 2012 resolutions then presentations of framework for sustainable water resource management. The presentations from private sector and civil society involvement in water resources management were conducted under session two. See Water Pitso Programme under annexure 5.

This report documents the deliberations at the Pitso and records the resolutions that were adopted to direct the operations of the MMEWR and its constituent departments for the next year.

DAY 1: March 20th 2014

2.0 Official Opening Session

Master of Ceremonies: Dr. Obolokile T. Obakeng-Director of Water Affairs

The Pitso started with an Official opening session which was presided over by the Hon. Onkokame Kitso Mokaila, the Minister of MEWR, Kgosi Kealetile Moremi and Mme Bernadette Malala the District Commissioner for Ngamiland. In welcoming delegates to Maun and to the Pitso, Kgosi Moremi highlighted the importance of water to life and called for cross-sectoral collaboration in the management of this precious resource. She acknowledged the presence of representatives from a diverse range of sectors at the Pitso and expressed the hope that this was the beginning of an integrated approach to the management of water in Botswana.

Kgosi Moremi's welcome remarks were followed by an overview of the Objectives of the Pitso by Mr. Kgomotso Abi, the Deputy Permanent Secretary-Water and Energy in MMEWR. The objectives were summarised as:

- To promote cross-sectoral consultations on topical and critical issues such as IWRM. The need for integration called for the involvement of other sectors outside the ambit of MMEWR, the invitations extended to the other sectors represented at the Pitso.

- To serve as a forum for reviewing resolutions from previous Pitso and to agree on how to carry forward these resolutions.
- To solicit ideas regarding improved water resources management.

The Pitso was officially opened by the Honourable Minister for Minerals, Water and Energy Resources Mr Onkokame Kitso Mokaila. In his address, the Minister acknowledged the theme of the Pitso describing it as appropriate for the situation Botswana finds itself in with respect to water resources availability, supply and management. Minister Mokaila observed that while Botswana had comprehensive water supply and delivery strategies over both the short and long term, there is a mismatch between water supply and sanitation services in the country. He therefore encouraged the Pitso to provide possible solutions to the imbalance between water supply and delivery of sanitation services which have a direct implication for poverty eradication. In conclusion, the Minister encouraged learning from each other and invited civil society entities to engage with government in promoting sustainable integrated water resources management. He also highlighted that the Pitso could focus on developing monitoring tools for tracking changes in water resources availability and quality especially against the background of climate change and increased water shortages. In this regard, knowledge that was being generated through projects such as Water Accounting would be vital for decision making in the country. Annex 3 of this report is the speech

2.1 Session 1

2.1.1 Progress to Date

The working session of Day 1 of the Pitso began with Mrs Bogadi Mathangwane, Deputy Director of Water Affairs giving an overview of the ground that the Ministry had covered to date starting with the 2011 Pitso. She gave an update on the actions that had been taken by government in response to the resolutions of the Pitso held in Mahalapye in 2012. Mrs Mathangwane reported that all the resolutions from the 2012 which called on government to take action against issues that were considered to compromise availability of water, water quality and access to water by Batswana had been acted upon. She highlighted that this quick response to issues by government was a clear indication that the Water Pitsos were considered to be important fora. Government would therefore continue using the outcomes of these fora to shaping its response and approach to addressing problems with water development and supply.

Annex 2 to this report provides a full list of the resolutions and the responses taken to date.

2.1.2 Framework for Sustainable Water Resources Management

In recognition of the fact that there are environmental limitations to water availability the 2014 Pitso included discussion on the implications of climate change and environmental management for water availability and supply in Botswana. Discussion of these issues was preceded by the two presentations summarised below.

Climate Change Impacts on Water Resources Availability and Possible Interventions: Ms Dorcus Masisi:
Principal Meteorologist, Department of Meteorological Services

Ms Masisi highlighted the predicted impacts of climate change on Botswana's water resources which will stem from projected increases in temperature and increased quantity and variability of rainfall. These will result in reduced runoff and ground water recharge with direct implications for overall water availability. The impacts of these developments were summarised as: decreased annual dam yields, increase in unmet water demand and decreases in groundwater levels.

Ms. Masisi proposed the following as possible responses to the predicted impacts of climate change:

- Institutionalisation of water conservation measures at all levels;
- Promotion of water harvesting technologies;
- Incorporation of the results of water accounting into water resources management policy;
- Introduction of technologies such as water desalinisation.

Water and Environment: Ms. Portia Segomelo-Director of Environmental Affairs

Ms Segomelo highlighted the need for the rationalisation of water demand and use with competing demands. The need for this was becoming more important given the implications of climate change. Water was to be considered as part of

the national stock of natural resources the use of which was to be managed within the context of the national strategy for sustainable development.

Ms Segomelo proposed the following actions to ensure that water was managed sustainably into the future:

- Balancing economic growth rates against available natural capital including water;
- Institutionalising Integrated Water Resources Management (IWRM);
- Adoption of the ecosystems approach to development planning including the use of Strategic Environmental Assessment as a planning tool;
- Increase cooperation with neighbouring states with whom Botswana shares watercourses-transboundary water resources management;
- Promoting stakeholder participation in water resources management through extensive public education and information dissemination regarding water supply constraints;
- Establishment of an effective Environmental Information System (EIS) for use in ecosystems restoration programmes. This was important in the management of flagship ecosystems such as the Okavango, the Chobe and the Limpopo which have the potential of being Botswana's primary water sources of the future.

2.1.3 Water Supply Challenges in Botswana

Key Challenges and Interventions to Water Supply in Botswana: Mr. Gaselemogwe Senai-Director-Infrastructure, Water Utilities Corporation

The presentations by Ms Masisi and Ms Segomelo were followed by a presentation on the key challenges in water supply in Botswana by Mr. Gaselemogwe Senai, the Director for Infrastructure Development at Water Utilities Corporation.

In his presentation Mr. Senai gave an overview of the water supply challenges experienced by WUC. These include unfavourable climatic conditions which are associated with recurrent droughts, spatial distribution of water resources vis-a-vis the distribution of population across the country (water is found in places that are far from population centres calling for long transmission networks) and increasing water demand.

WUC also faces operational challenges including ageing water supply infrastructure, vandalism, treatment plant deficiencies, weak human resource capacity, poor network maintenance, and poor customer data resulting in poor service delivery and statutory hurdles which affect the pace of capitalisation of the system.

Possible interventions that were highlighted by Mr. Senai included:

- supply augmentation involving the optimisation of the North South Carrier 1 and completion of the North South Carrier 2, Wellfield Development, artificial groundwater recharge, and construction of emergency supply projects;
- Water Demand Management including reduction in non-revenue water, restrictions/rationing of supply, awareness raising, waste water reuse and recycling and the introduction of tariff regimes that encourage water use reduction.

Summary of Discussion following Mr. Senai's Presentation

Discussions that followed Mr Senai's presentation covered the following issues:

- The need to manage water use in an environment where some stakeholders were extending the use of portable water to livestock and the need to ensure that all stakeholders were paying the appropriate tariff for water. Botswana should not expect to get high quality services when they expect to continue paying low tariffs for water.
- WUC was encouraged to ensure that they had adequate spread of skills to cover all fields of water resources management. An example was the need to incorporate wellfield management services within their skills base.
- There is a lot of wastage of water among institutional consumers such as police, military and prison, school and hospital establishments. Demand management approaches were necessary at these establishments to reduce waste.
- Incidents of water pollution (surface and ground) due to poor rationalisation of water supply and sanitation programmes were a serious concern across the country and needed to be managed.
- Artificial recharge of aquifers was considered to be an important intervention in Botswana where evaporative losses of water from dams were generally very high.

The Pitso concluded this discussion by agreeing that while WUC was charged with the responsibility for water supply and managing waste water, it was the responsibility of everyone to ensure that the country's scarce water resources were managed in a sustainable manner.

2.2: Session 2

2.2.1 Private Sector and Civil Society Involvement in Water Resources Management

Master Of Ceremonies: Mr. Kenneth Kerekang-Director of Energy Affairs

In line with the objective of the Pitso to involve all stakeholders in the deliberations of the management of water resources in Botswana presentations were also received from private sector entities that have huge implications for water use and availability in the country as well as from representatives of civil society organisations. In addition, the Pitso also included a discussion of measures that are being taken to apportion appropriate values to water and other natural capital resources in Botswana as a way of promoting sustainable utilisation of these resources.

The paragraphs below summarise the presentations and discussions of these issues.

Strategic Intentions of the Mining Industry Pertaining to the Water Sector: Mr. Charles Siwawa, CEO Botswana Chamber of Mines; Mr. Banda Maswabi, Debswana and Mr Thabo Morake, BCL Mine

The presentations from the mining sector all highlighted their focus on sustainable use of water resources. Mr. Siwawa emphasised the need for continuous improvement in water management practices by the mining sector especially given the fact that up to 50% of all prospecting activities currently under way in Botswana could lead to active mining. The mining industry has therefore committed itself to reducing its water consumption from the current 33% of national water use.

Mr. Banda Maswabi gave an overview of Debswana's water management strategy which includes the development of stand-alone water supply facilities at the various mines, the introduction of water reuse programmes as well as introducing greater efficiency in water use as ways of reducing overall water demand in the industry.

Mr. Morake indicated that the major issue of concern at BCL Mine in Selibe Phikwe was with regards to pollution of surface water from discharge of effluent from underground operations. Currently BCL were using this for irrigation at the mine and had plans to supply water to recreational facilities as well as for watering public parks in Phikwe.

The overall target in the mining sector was to achieve zero discharge of water from mining operations into surface water bodies. This way pollution of surface water would be mitigated.

Civil Society and Community Participation in Water Resources Management: Mr. Felix Monggae-CEO Kalahari Conservation Society

Mr. Felix Monggae highlighted the dual roles that CSOs and NGOs play in water resources management as social watch dogs and service delivery agents either in partnership with governments or on their own. In performing these two roles CSOs usually help to promote transparency and good governance in water development and supply while at the same time providing cost-effective and sustainable services on account of their closeness to the ground. CSO generally participate in water resources management through policy formulation, agenda setting, playing a bridging role between governments and the people and conducting action oriented research.

Mr. Monggae concluded by emphasising that CSOs and NGO are not always at loggerheads with governments but can work hand-in-hand with state institutions to advance government led programmes. They are usually more efficient than governments due to the fact that they are involved in less red tape and usually get work done more quickly.

Water Accounts: Mr George Thabeng and Dr. Jaap Arentzen

The presentation on Water Accounting pointed to the fact that natural capital accounting was useful for the efficient allocation of strategic resources such as water. The findings from resource accounting are usually incorporated into management and development planning processes concerning the subject resource and direct the allocation of resources to the most deserving sectors. Throughout the process human needs, environmental needs and supply to strategic sectors are safeguarded. Resources accounting also facilitates continuous collection of data which assists with planning.

The water accounts done for Botswana to date include data on reservoir water availability, trends in water abstraction, use and use efficiency. They also measure the extent to which water use and allocation is sustainable over time. The accounts are already proving invaluable in water policy formulation especially in the context of the water sector reforms that the country has just concluded.

Summary of discussion following Session 2 Presentations

Discussions highlighted the fact that water supported all manner of economic activity including those that are usually classified as non-formal even when they sustain livelihoods of many people. Water allocation to such activities therefore needs to be considered carefully as cutting them out would compromise the livelihoods of many Batswana.

Agricultural water use accounts for 39% of water consumption on Botswana. The question that needs to be addressed is whether this sector uses water sustainably or whether it was strategic enough to deserve this level of uptake of a scarce resource.

Given the scarcity of water in Botswana efforts need to be re-doubled to establish and commission alternative water sources to the traditional ones that are in-country. New sources should include the transboundary resources that abound in the north of the country.

Day 2: March 21st 2014

3. Group Discussions

Following the presentations and discussions summarised above the Pitso participants were divided into four groups to address the questions highlighted below. These questions were pre determined on the basis of the main topics of the Pitso while some were developed from the discussions that followed presentations detailed above.

Group 1: Policy and Legislation

- 1 What are the gaps in Botswana's Water Policy and legislative framework?
- 2 What are the roles and responsibilities of different stakeholders in development and implementation of policies?
3. Can you suggest effective feedback mechanisms for promoting policy and legislative development?

For the above questions;

- a) Suggest key-players and lead agency roles to play.
- b) Suggest timelines and possible source of funding

Group 2: Technology

1. Are the existing technologies in the water sector adequate? Please qualify your response.
2. Upscaling – What effective mechanisms can we deploy?
3. Use of Indigenous technology.

For the above questions;

- a) Suggest key-players and lead agency roles to play.
- b) Suggest timelines and possible source of funding

Group 3: Civil Society and Community Participation

1. What opportunities exist for civil society and community participation in water resources management?
2. What roles do you see these organisations playing?
3. Suggest incentives that can be put in place to promote civil society participation and community participation.

For the above questions;

- a) Suggest key-players and lead agency roles to play.
- b) Suggest timelines and possible source of funding

Group 4: Environment and Climate Change

1. What role does water play in promoting sustainable national development strategy.
2. Suggest effective mechanisms to promote cross sectoral coordination in water resources management

For the above questions;

- a) Suggest key-players and lead agency roles to play.
- b) Suggest timelines and possible source of funding

The outcomes of the Group discussions were presented to a plenary session where they were discussed and synthesised into the summary presented in Table 1 below:

4.0 Resolutions from 2014 Pitso

The resolutions in Table 1 below were synthesised from the deliberations at the 2014 Pitso. The Pitso recommended that these be followed up by the Ministry of Minerals, Energy and Water Resources together with those from 2012 which had not been fully auctioned.

Table 1: Resolutions from 2014 Pitso

Resolution	Facilitator(Before next Pitso)
1. All the issues that were raised at the 2014 Pitso which have policy and legislative implications should be checked against the provisions of the Draft Water Policy to ensure that there is no repetition of issues that have already been covered.	MMEWR-Lead partner AG's
2. Government is to promote the enhanced use of modern and indigenous technologies in the management of water resources. Such use of technology is to facilitate the involvement of all stakeholders.	Kalahari Conservation Society-Lead partner -UNDP -DEA -DWA -WUC -MoE -MLG
3. Government should encourage the increased participation of civil society organisations and NGOs in water resources management	Department of Water Affairs-Lead partner Kalahari Conservation

4. There is need for institutionalisation of IWRM as a management strategy for water resources in Botswana.	Department of Water Affairs-Lead partner MoE
5. Groundwater is the principal source of water for a large section of the population of Botswana but this resource is not fully understood. Botswana should establish a Groundwater Management Institute to advance the understanding of this critical resource.	Department of Water Affairs-Lead partner -Chamber of Mines -DGS -Mines -WUC
6. Botswana should explore all opportunities for harvesting water to augment current sources. The harvesting of effluent water from air conditioning units which are in extensive use across the country should be explored for its viability.	Department of Water Affairs-Lead partners -WUC -MLG & RD -COM -MoA -DBES -Ministry of Trade
7. Water accounting should be institutionalised as part of the water resources management policy formulation processes in Botswana.	Department of Water Affairs-Lead partner -CAR -BOCCIM -WUC -MoA

Note: The lead partner/s can co-opt other organisations as and when need arises

5.0 Closing Session

The Pitso was closed by Kgosi Oleyo Ledimo who observed that the holding of the meeting in Maun might be an indicator that government was going to promote the development and use of the abundant water resources in Ngamiland to fuel national development. He also highlighted the importance of water to human survival and the survival of all other biological resources. This behoves us all to manage this precious resource for the sake of our own survival and that of posterity.

Annexes

ANNEX 1

Group discussions

Table 1: Summary of Group Discussions

Questions	Responses/Comments
<p>1. What are the gaps in Botswana’s Water Policy and legislative framework?</p>	<ul style="list-style-type: none"> • Lack of law enforcement within water ways • There is no permitting system on recreational uses of water • Lack of clarity on who grants water rights (Role of Landboard/Water Apportionment Board) • Lack of integrated planning in land & water resource allocation • Indiscriminate claiming in the forms for livestock or agricultural activities • Lack of resource rent • Lack of policy provision on aspect of waste water management (e.g. Polluter pays principle) • Insufficient punitive provisions for Water Wastage • Policy instrument to address pollution risks <p>KEY PLAYERS. DWA; WUC; MoA; Mines, Tourism, Health, NGOs, Civil Society, Landboard, Farmers, Private Sector, AG- Law enforcement Agencies, METSEF</p>
<p>2. Roles and responsibilities of different stakeholders in development and implementation of policies.</p>	<ul style="list-style-type: none"> • Identification of water resources: DWA, DGS, Mines, Private Sector • Development of water resources: DWA, Mines, Private Sector • Protection of water resources: DWA, DEA, DWMPC, DGS, Civil Society, WUC • Provision of water services: WUC, Private Sector, Agric • Monitoring of water resources: DWA, DGS, WUC • Regulation of resource use: WUC, DEA, WAB • Policy formulation: DWA, AG, WUC • Legislation: AG
<p>3. Can you suggest effective feedback mechanisms for promoting policy and legislative development?</p>	<ul style="list-style-type: none"> • Water forums (e.g. PITSO) • Kgotla meetings • Benchmarking • Workshops • Media • Research <p>TIMELINE: immediately</p> <p>FUNDING SOURCES: central government, private sector, international cooperating partners , taxes and tariffs</p>

ANNEX 2

2012 Water Pitso Resolutions

2012 Water Pitso Resolutions

Resolution	Action Taken
<p>1. Provision of water supply for livestock and other agricultural activities</p>	<ul style="list-style-type: none"> • Construction of small earth dams – To date over 250 has been constructed countrywide. Amongst the 250 only 8 dams have enough capacity to include irrigation. The rest are for livestock. • Construction of perforated concrete ring wells along sand rivers to abstract water for livestock and irrigation. The assistance is also extended to wells (petse) outside rivers which are owned by individual farmers. All of the wells yield adequate water all year round hence very reliable.
<p>2. Illegal Sand mining leading to deterioration of river water quality</p>	<ul style="list-style-type: none"> • The Department of Mines and Department of Environmental Affairs (DEA) agreed that Department of Mines (DoM) will only issue mining license to clients with authorization from DEA to ensure that environmental assessment has been conducted. • A high level task team was formed comprising of Directors and Permanent Secretaries from five ministries of MMEWR, MEWT, MLG, MLH and MDJS. The task team came up with a strategic plan to curb illegal sand mining and is still to be implemented. A Cab Memo was circulated to all the ministries for comments in September 2013. • Following up DGS assessment, some segments of certain rivers have been zoned for no mining since they have been extremely degraded. Therefore no authorization or mining licenses are given for these sensitive river segments. • One of the short term measures to mitigate the practice was a suggestion that a team made up of different stakeholders to come together and physically monitor the miners at the site.
<p>3. Conjunctive use of groundwater and surface water.</p>	<ul style="list-style-type: none"> • The villages of Palapye, Mahalapye and Mochudi which are connected to NSC conjunctively use the groundwater from Patikwane and Palla Road Wellfields. • Furthermore Malotwane, Kgoro and Ramotswa wellfields are considered to be used with surface water from Letsibogo, Gaborone, Bokaa, Letsibogo and Nnywane dams. • The Department of Water Affairs (DWA) and Chalmers University of Technology Sweden have partnered to carry out “Artificial Groundwater Recharge In Botswana - A pre-feasibility study and capacity building” project. This project is funded jointly by SIDA and GoB. The project started November 1, 2012 and is now scheduled to be completed by 31 March 2014. The main goal of the project being to increase water supply safety in Botswana.

<p>4. Research and Development in appropriate technologies for efficient water use for sustainable water management in agriculture</p>	<ul style="list-style-type: none"> • Total national water requirements for agriculture is estimated at 59.81 Million cubic meters for live stock and 136.75 million cubic meters for arable agriculture sector. • National cereal output is below 2 tons/ha and horticulture is less than 40 tons/ha of optimum average • 3500 hectareage may be adequate to meet national demand with a substantial surplus for export. However the output is less at 30% to 40% and the rest is from imports. • Draft policy statement clearly defines strategies that support Research and Development. However, some gaps have been identified and these include: • Crop and livestock program investigations • Human Resource Training/Development • Information Communication and Technology <p style="text-align: center;">Solution to Challenges</p> <ul style="list-style-type: none"> • Improve efficiency and productivity of water usage • Reducing losses in storage and conveyance • Applying suitable and precise irrigation practices, and sustainable water usage techniques • Use of water efficient crops and animal breeds • Hydroponic systems • Environment friendly productive systems (field run off, animal waste management)
<p>5. Runoff or storm/rainwater harvesting</p>	<ul style="list-style-type: none"> • <u>Shoshong Senior Secondary School</u> - The capacity of the water collection facilities is 24 M3 and water is used for flushing ablutions • <u>DWA HQ</u> - The project was completed in 2009. The storm water and rainwater collected is used for car washing and landscaping. • <u>Khawa</u> - an underground water tank of 30 cubic meters was constructed. The harvested water is used for watering the community garden. The project was done in collaboration with ORASECOM and UNDP/GEF. • <u>Our Lady of the Desert</u> - An underground tank with a capacity of 81 M3 was constructed for rain water harvesting. And used in the school garden. • <u>Marobela Brigade</u> - An underground tank of 160M3 was constructed by the Brigade in 2012. The harvested water will be used for vegetable production in the institution and for the support of the poverty eradication initiative in the village. • <u>Stormwater Runoff</u> – The objective of the project is to promote and facilitate the

	<p>construction of infrastructure of small scale that can intercept and retain runoff events. This is still being progressed.</p>
<p>6. The government to introduce farmers' compensation policy as an incentive for venturing into agriculture</p>	<ul style="list-style-type: none"> • Ministry of Agriculture advises that it be taken up during this year's Pitso (2014)
<p>7. Formation of a joint committee to harmonize government policies for all sectors</p>	<ul style="list-style-type: none"> • Item to be discussed during the group sessions (Pitso 2014)
<p>8. To establish the feasibility of recycling water tourism related business</p>	<ul style="list-style-type: none"> • DWA has collaborated with Mbiroba Camp on grey water recycling. The project will then be rolled out to other facilities with the intension of minimizing the discharge of effluent onto the environment. • Botswana Tourism Board is implementing the Botswana Ecotourism Certification System that encourages the hotels and the lodges to re-use their waste water within their operations hence no discharge into the river systems.

ANNEX 3

Minister's speech



Republic of Botswana

**SPEECH BY THE MINISTER OF MINERALS ENERGY AND WATER RESOURCES HON
ONKOKAME KITSO MOKAILA MP**

**WATER PITSO DAY
20- 21 MARCH 2014
MAUN**

THEME:

“Sustainable interventions to address Botswana water challenges”.

1. Salutations
2. Director of ceremony, it is my pleasure for me to address a wide spectrum of participants that ranges from the government, non-government organizations, civil society, academia and the private sectors who are gathered here to discuss issues of water.
3. It is this somber scenario that brings us all together in this Pitso to discuss issues of water hence the theme **'Sustainable interventions to address Botswana water challenges'**. I am certain that you will all agree with me that this theme cannot be more appropriate, as of recent, it has been clearly visible that water is a major driver of both economic and development growth and not just a social responsibility. In Botswana, it is evident that there have been changes in rainfall trends, sometimes there is extremely low (below 200mm/yr) or extremely high amounts of rainfall (above 400mm/yr). All of us here can bear testimony to the rainfall pattern in the past weeks. The northern part of the country and most parts of the Kgalagadi have experienced high amounts of rainfall resulting in floods in some areas, whereas the south eastern part experienced relatively low rainfalls.
4. Ladies and gentlemen, this year's theme for the Pitso provides a platform for us to identify our water challenges and find sustainable interventions. The key challenges amongst others include but are not limited to absence of suitable dam sites; climate change effects (variable and low rainfall amounts, high evapotranspiration rates resulting in low recharge rates and

reduction in dam yields) and; spatial mismatch between water demands and availability requiring investment in large infrastructure leading to water shortage. This situation is exacerbated by increasing pollution risks to water resources due to poor sanitation. At the current rates of abstraction, the lifetime of groundwater resources is limited to decades, unless sustainable interventions such as artificial recharge are put in place, of which my ministry is currently developing.

5. The government, through my Ministry is committed to ensuring water supply to her people as well as ensuring water security into the foreseeable future. It is no news that over and above the challenges, my Ministry is faced with a mammoth task to pull this off in a drought prone country like Botswana. The government has over the years embarked on several key projects to avail water. These projects range from long term (which spans decades and include the construction of dams and other capital projects), to medium and short term projects.

Long Term Projects

- i) Dikgatlhong Dam 400MCM which will augment supply to the Greater Gaborone area. Dam construction was completed in 2013. The dam is currently 100% full.
- ii) The NSCII **Pipeline** which will transport water from Dikgatlhong Dam to the south. The First 78km to be completed in May 2014.
- iii) **Thune Dam** 90MCM which will supply the Palapye area. Construction completed in 2013. Dam not yet in use.
- iv) **Lotsane Dam** 42MCM which supplies the Tswapong area. Construction completed in 2013.

- v) **Chobe/Zambezi transfer scheme.** Botswana has been allocated 495 million cubic metres of water by the other riparian countries. Phase I which will comprise the abstraction of water from the Chobe/Zambezi Rivers through a 100km, 2.7m diameter pipeline is scheduled for completion in 2015. The pipeline will cater for both commercial (irrigation and processing) and domestic use.
- vi) **Lesotho Highlands Water Project.** Feasibility to transfer water to the southern part of Botswana.
- vii) Feasibility of **artificial recharge** in Botswana.
- viii) **Saline water utilization** in Botswana.
- ix) **Grey water recycling**
- x) The **Maun Water Supply and Sanitation Project** which is scheduled for completion in 2018.

Medium to Short Term Projects

My Ministry through Water Utilities Corporation is currently undertaking over 100 short to medium term projects to address water supply challenges around the country. Of interest to you here in Maun will be the water supply scheme that will be officially commissioned tomorrow. This scheme has brought an additional 6MI/day of water. I sincerely hope this will ease on the water deficit that has been plaguing the village.

6. Director of Ceremony, ladies and Gentlemen, being a finite resource, there is always a need for water to be used wisely and conserved at all times. Above all the initiatives I have outlined, the greatest and most likely initiative to give us the desired results in ensuring sustainable water supply is water demand management.
7. Director of Ceremony, since I am one of the pioneers of these Pitso's, let me take an opportunity to explain how they should be planned and implemented. First and foremost ladies and gentlemen, these Pitsos were initiated to cultivate and build solid partnerships between the Government and all relevant stakeholders. They enshrine our democratic values of continuous consultation processes for the benefit of our country as the Setswana say '*....wa esi ga o ele*'. This on its own is an acknowledgement that Government does not have a monopoly of good ideas and strives to work hand in hand with its stakeholders at all times.
8. Secondly the planning and ultimately the monitoring of the resolutions from the Pitso's need to be done in collaboration with all the relevant stakeholders. This will ensure that we achieve our Vision 2016 goals, water policy goals and ultimately the Millennium Development Goals. The collaboration will also certainly aim to bring water security to all sectors.
9. My ministry has developed a National Water and Wastewater Policy which has been approved by Cabinet and soon to be presented to 2014 Parliament for approval. The National Water Policy represents the first step in a continual process to

ensure that water is properly positioned to meet the needs of the nation and its people. The key pillars of the policy are Equity, Efficiency and Sustainability. The sector therefore aims to develop and review existing water legislations and regulations by introducing enforceable policies and tight control systems which are crucial for efficient water management practices.

10. In line with In December 2013 my ministry launched a national plan for Integrated Water Resources Management / Water Efficiency (IWRM), which calls for amongst other things, cross-sectoral coordination, efficient use of water and integrated, people-centered planning (gender specific needs, poverty alleviation, social justice, equitable access to affordable safe water and sanitation for basic human needs).

11. In line with the Water Policy, my ministry is also implementing a project on Wealth Accounting and Valuation of Ecosystems (WAVES) partnership program. With a growing population, decreasing water resources and increasing demand for water, there is an urgent need to judiciously account for every drop of water that is available in Botswana. Through WAVES program, Botswana Government is committed to accurately assess water resources; how much water is there; where to use this water; what is the situation right now; what is the sustainable capacity of this resource and what implications are for sustainable development in Botswana. WAVES has completed a report on Phase 1 and 2 of the water accounts and the

report will assist the Government to better manage its scarce resource. Ladies and gentlemen, you will get an opportunity to learn more about this initiative during one of the sessions in this Pitso.

12. Director of Ceremony let me take this opportunity to thank all those stakeholders that were involved in making sure this Pitso takes place. Le ka moso betsho. I urge you to continue and make sure that all the resolutions that we agree on at the end are realized. This is not a water sector thing but all of us need to play a role.

13. I wish you fruitful deliberations and officially declare this forum open.

14. Pula!!!

ANNEX 4

Presentations from 2014 Water Pitso

Presentation 1

Climate Change Impacts on Water Recourses Availability and Possible Interventions by
Ms. Dorcus Masisi (Principal Metereologist)

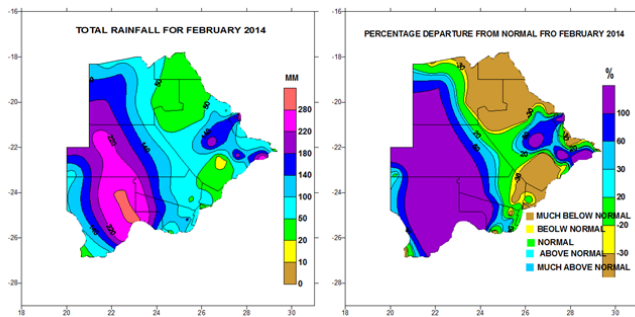
Dorcas Masisi Meteorological Services

Water Pitso
20-21 March 2014
Maun

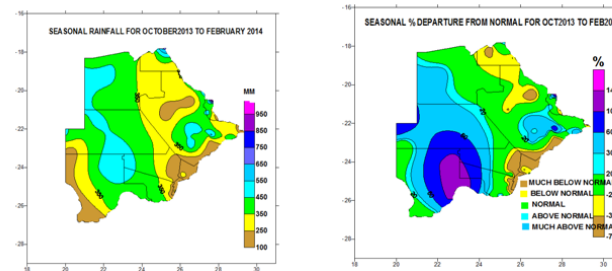
OUTLINE

- Rainfall
- Observed global Temperature
- Observed change in annual precipitation
- Changes in runoff
- Changes in ground water recharge
- Impacts
- Adaptation measures

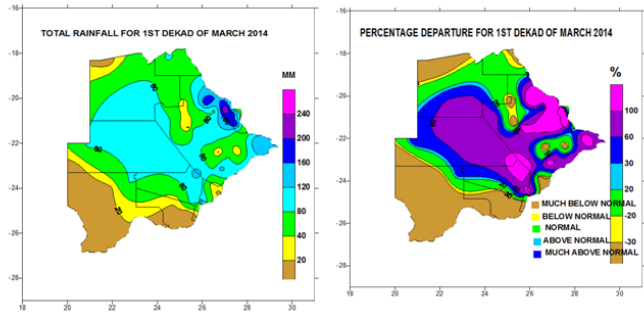
Rainfall for February 2014



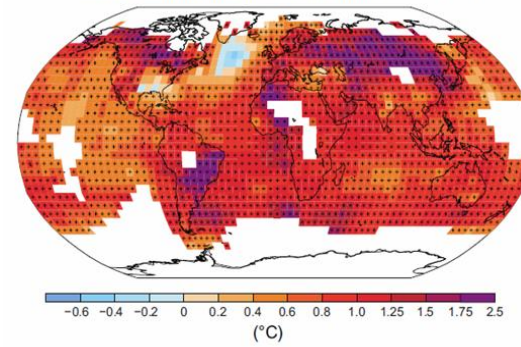
RAINFALL FOR OCTOBER 2013 TO FEBRUARY 2014



RAINFALL FOR THE FIRST DEKAD OF MARCH 2014

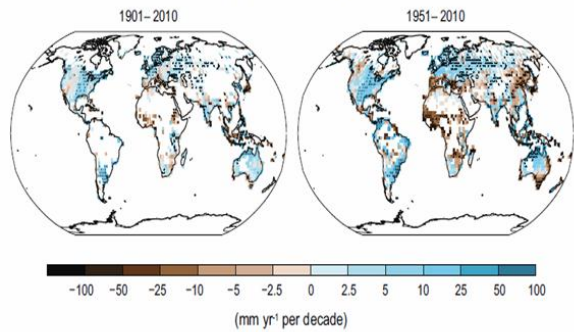


Observed change in surface temperature 1901–2012



Source IPCC 2013

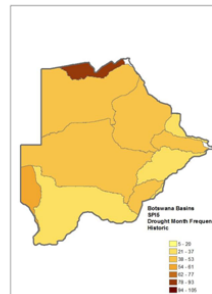
Observed change in annual precipitation over land



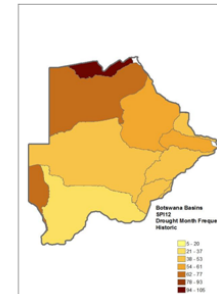
Source IPCC 2013

Historic Droughts using SPI

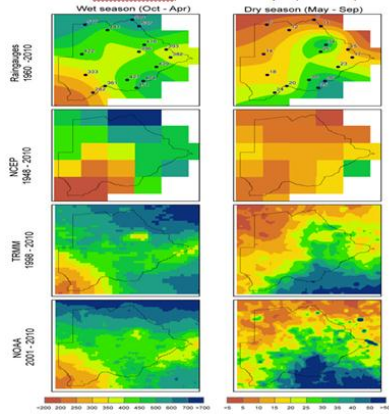
5 Month Standardized Precipitation Index (SPI), Botswana 1961–1990 rainfall record (360 months); (Mitchel and Jones 2005)



12 Month Standardized Precipitation Index (SPI), Botswana 1961–1990 rainfall record (360 months); (Mitchel and Jones 2005)

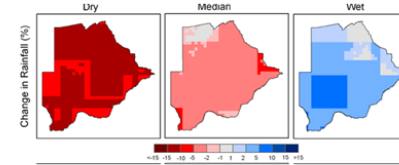


Comparison of wet (left panels) and dry (right panels) season rainfall across Botswana as derived from rain gauges, NCEP reanalysis, TRMM, and NOAA datasets.

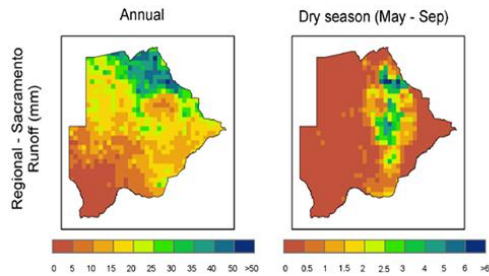


Percent change in annual rainfall

projections for ~2030 (representing 1 °C of global warming), the dry projection is for a reduction in rainfall of 50 mm (10%), the median projection is for a reduction of 15 mm (3%), and the wet projection is for an increase of 13 mm (also around 3%).

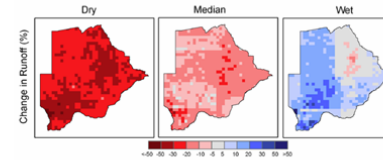


Historical mean annual and dry season runoff across Botswana as derived from the Sacramento rainfall-runoff model driven by TRMM rainfall inputs and NCEP APET inputs.

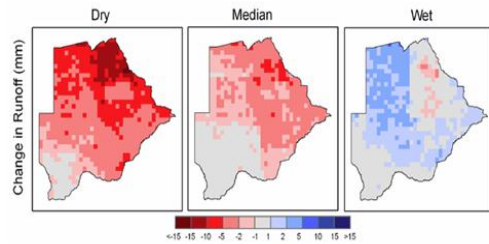


Percent change in annual runoff across Botswana for the dry, median and wet projections of future climate.

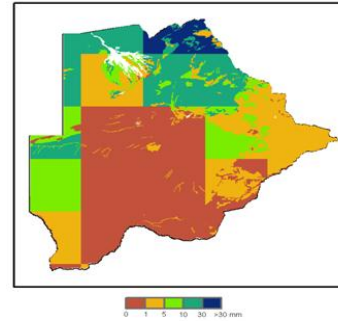
under the dry future projection, runoff is projected to decrease by 5 mm (30%), under the median projection, runoff is projected to decrease by 2 mm (12%), while under the wet future projection, runoff is projected to increase by just 1 mm (6%).



Change in annual runoff (mm) across Botswana for the dry, median and wet projections of future climate.

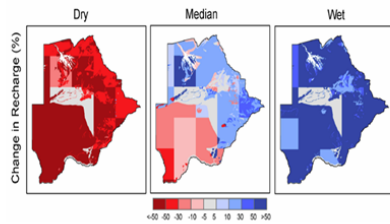


Historical diffuse groundwater recharge across Botswana (mm).



Ground water recharge

Due to the low rates of historical groundwater recharge and the relatively small projected changes in rainfall, changes in diffuse groundwater recharge by ~2030 are projected to be mostly insignificant.



Impacts

- Decrease in dam annual yields
- Average increase in unmet water demand
- Groundwater declines

Proposed adaptation measures

- Water conservation measures and awareness campaigns
- Water accounts studies and implementations
- water cuts and/or restrictions
- More use of rainwater catchment systems
- Desalination

Thank you

Presentation 2
Water and Environment by
Ms. Portia Segomelo-Director DEA

WATER AND ENVIRONMENT

Portia Segomelo
Department of Environmental Affairs
Ministry of Environment Wildlife and
Tourism

THE SUSTAINABLE DEVELOPMENT QUESTIONS ???

How do we plan to meet the water needs of the country within the context of competing needs

- How can Botswana diversify the economy beyond diamonds
- Eradicating poverty and inequality
- Addressing the threats of Climate change
- Sustainable Production and Consumption patterns
- Employment creation & food security
- Climate change

The Development Context

National Development Planning Framework

- * Management of Natural Capital for Economic Growth
- * Cross-sectoral linkages
 - * Trade-offs among different objectives
 - * Integrated development objectives
 - * Taking responsibility and accounting for natural resource status
 - * Scenario planning and priority setting (water, energy, infrastructure, agriculture, tourism, mining etc)
- * Connection between water and development in terms of
- * Water consumption, contribution to GDP and formal employment in the context of sectors of agriculture, mining, service sectors

Integrated water planning and management

Integrated Water Resource Management – IWRM

- * Ecosystem planning approach – Biodiversity Strategy & Action Plan
- * Natural Capital Accounting - WAVES
- * Strategic Environmental Assessments EIA Act
- * Economic Diversification, poverty reduction, food security
- * Trans-boundary water management

Concluding remarks

Stakeholder participation in IWRM

Integrating value of natural capital – livestock, mineral and water accounts

- * Building social capital and reducing poverty – bee-keeping, Chobe forest reserves for eco-tourism, CBNRM
- * Ecosystem restoration – ecological water requirements, wetlands management plans (ODMP, MFMP, BioChobe, drylands ecosystems)
- * Building the knowledge data capacity and policy network for SD – Environment Information System
- * Effective communication and public education – NEESAP (water supply, quality, scarcity, value and management)

* THANK YOU!

Presentation 3
Key Challenges and Interventions to Water Supply in Botswana by
Gaselemogwe Senai- WUC Director Infrastructure



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**WATER PITSO
MAUN
20 – 22 MARCH 2014**

**THEME “ SUSTAINABLE INTERVENTIONS TO
ADDRESS BOTSWANA WATER CHALLENGES ”**

KEY CHALLENGES AND INTERVENTIONS TO WATER SUPPLY
IN BOTSWANA

[Gaselemogwe Senai, ID](#)



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PRESENTATION OUTLINE

1. Objective
2. Background
3. Vision 2016 in relation to water services
4. Challenges to sustainable water supply
5. Interventions



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1. OBJECTIVE

The primary objective of this presentation is to discuss key challenges and interventions to water supply in Botswana.



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2. BACKGROUND

- WUC provides water and wastewater services to 2.1 million Botswana in a full cost recovery bases.
- The company has a statutory obligation to provide water and wastewater services to Botswana in a cost recovery manner
- In doing so it has to carefully plan to meet current and future demand for water and take cognizance of potential changes to its available supplies.
- The Corporation’s 10 year master plans are premised on the National Water Master Plan Reviews
- An essential part of this planning is to assess the impact that droughts have on water supply services.

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WATER SERVICES IN RELATION TO VISION 2016

- 100% coverage of water and wastewater services in the entire Botswana by 2016.
- Provide sustainable, cost effective, efficient water and wastewater services to all and the economy.

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VISION 2016 IN RELATION TO WATER SERVICES

- WUC's vision is to provide water and wastewater services in a cost effective and environmentally friendly manner to the economy.
- The National Water Policy (2012) is based on three fundamental pillars of equity, efficiency and sustainability.
- The above will not only be a pipe dream but a colossal failure if the current challenges on the water supply are not sufficiently addressed.
- The following section provide the current challenges to water supply.

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3. Challenges

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3.1 UNFAVOURABLE CLIMATIC CONDITIONS


Rainfall distribution

- There is a northeast-southwest gradation of mean annual rainfall represented by a line from Kasane (650 mm) to Bokspits (170mm)
- Sometimes, 70% to 90% of the annual total rainfall may occur in only one month.
- Rainfall incidence is highly variable both spatially and temporally.
- Rainfall is very variable both in space and time.
- Temperatures range from below zero in the south during winter and can be greater than 40 degrees in summer.
- High evaporation rates averaging between 2200-2400mm along the Limpopo system where all the dams are located

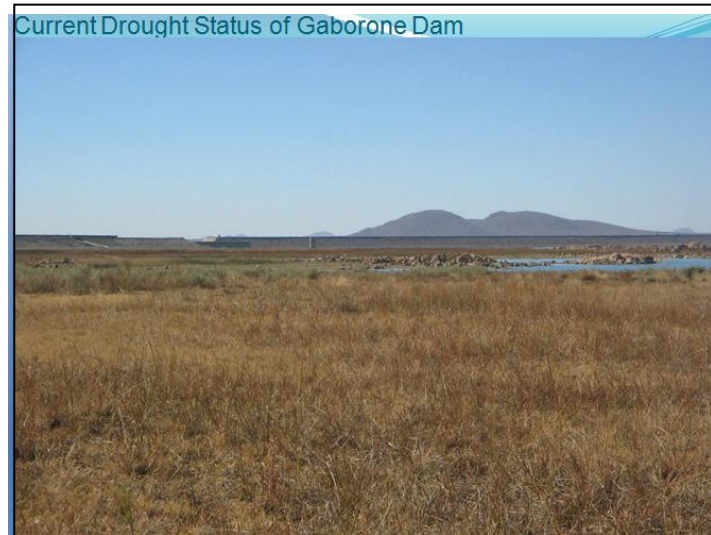
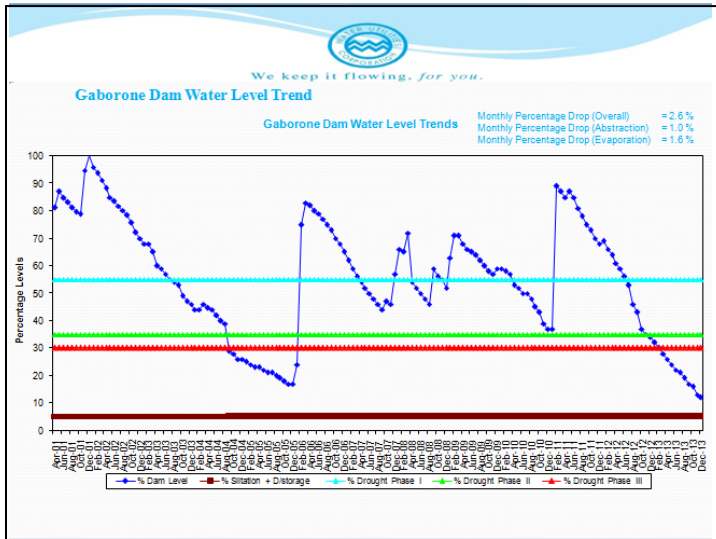

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3.2 Drought Occurrence

- Water resources are susceptible to drought;
- Low rates of recharge to its groundwater with about 40 mm in small areas in the Chobe District in the North and over most of the Kalahari region it approaches zero
- Severe drought events, particularly in the South, were experienced in;
 - 1981/82/83/84; resulting in the raising of the Gaborone Dam Wall
 - 1986/87
 - 1991/92, 1994/95
 - The Dam last over spilled in 2000
 - 2002/03/04/05/06; resulting in the Gaborone Dam level dropping to 16%
 - 2011/12/13.....to-date; resulting the Dam reaching unprecedented level of 11%

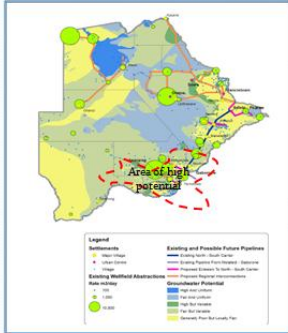

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Dam	Capacity MCM	19/03/2013 Levels (%)	12/03/2014 Levels (%)	Latest Levels (%) 19/03/2014	Months of supply without inflow	Area supplied	Percentage contribution to area supplied
Gaborone	141.4	28.6	16.0	16.2	5	Greater Gaborone	56
Molatedi	201	31.7	26.3	33.6	42	Greater Gaborone	16 at full allocation 8 at half allocation
Bokaa	18.5	33.0	57.0	63.0	10	Greater Gaborone	25
Nnywane	2.3	Failed	75.8	77.0	11	Lobatse	10
Letsibogo	100	90.6	103.7	101.4	23	Greater Gaborone	36
						S.Phekwe, B CL & Mmadinare	100
Shaehe	85.0	95.4	103.8	100.2	23	Mahaabye&Palapye	100
						Greater Francistown	100
Ntimbale	26.5	99.6	102.6	100.4	15	North East & Tutume District	50 (The other 50 from Matsiengwe/Welkele)
Dikgathong	400	46.6	106.5	102.5	-	-	-
Lotsane	40	12.5	108.3	100.3	29	-	-
Thune	90	-	55.5	55.7	-	-	-

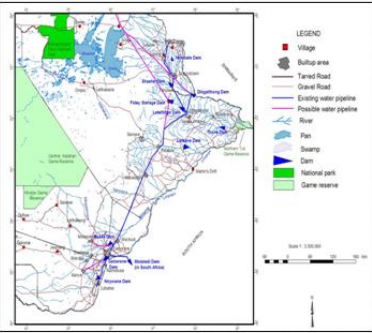


3.3 Spares distribution of water resources

Groundwater- Wellfields

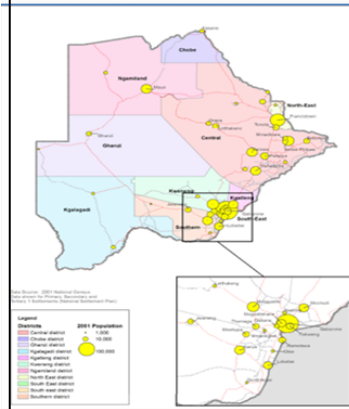


Surface water- dams



- Abstraction mainly on the eastern corridor
- Area of high potential appear on the central part of the country
- Most dams located in the northern part of the country

3.4 Spatial Distribution Population distribution



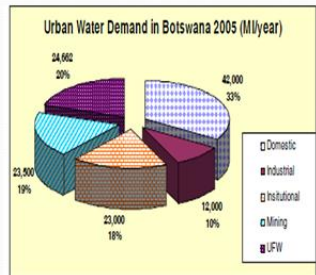
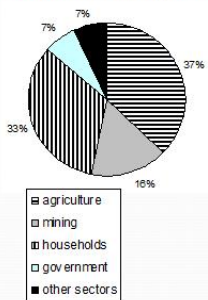
- Population is congregated in the eastern region of the country.
- In 2001, 87% of the population were located in the Eastern and South-Eastern Planning Regions
- The Northern Region, which includes the fertile Okavango Delta, had 8.5% of the country's population, while the Western Region, which is dominated by the Kalahari Desert, is sparsely populated.
- A similar kind of distribution pattern is seen in 2011 population census



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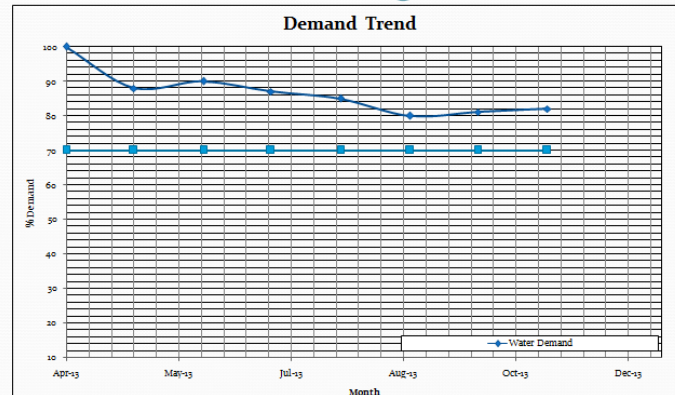
3.5 High Water Demand

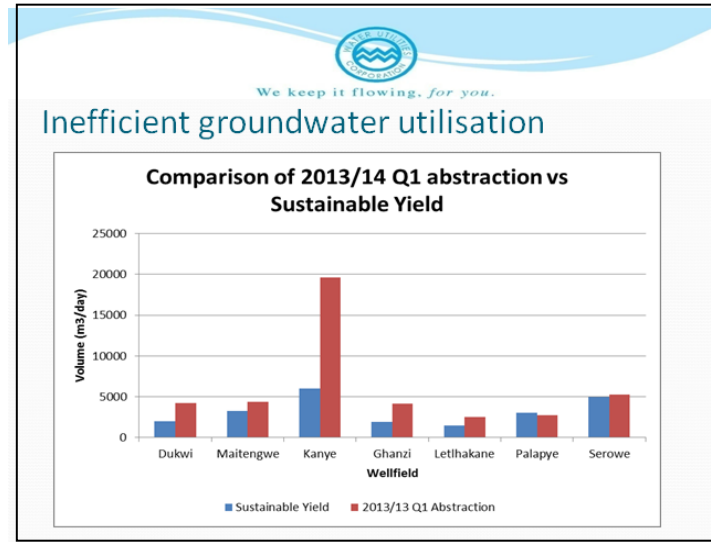
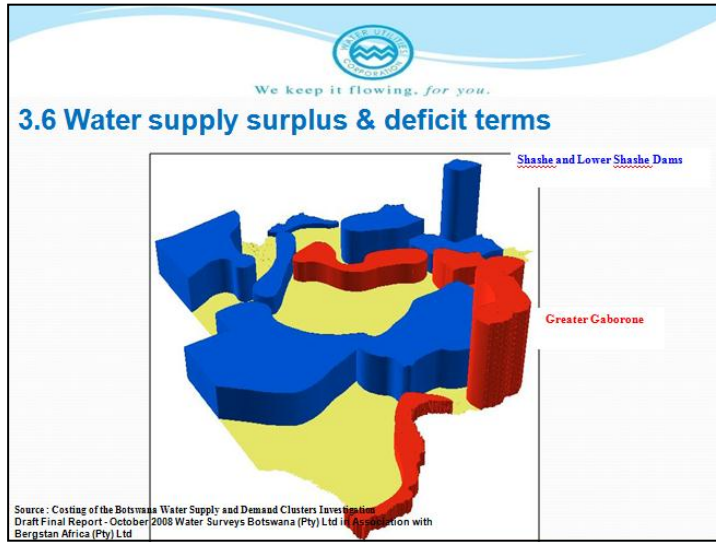
- Current country water demand



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6.1 Water Rationing







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4. Operational Challenges

Infrastructure challenges due to:

- Aged or disrepair and therefore prone to leaks and high NRW
- Vandalism for livestock watering
- Inadequate network coverage owing to insufficient land servicing
- Water treatment plant deficiencies
- Poor maintenance





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Other Operation Challenges cont.....



- The Corporation is facing serious challenges that have drastically affected its financial stability and customer services standards.
- Currently the Corporation is struggling to maintain a satisfied pool of customers primarily due to;
 - Poor customer data and inaccurate meter reading, late or no billing and consequent poor customer service and satisfaction.
 - Statutory challenges.
 - High NRW.
 - Poor infrastructure maintenance.
 - Insufficient capital (high operating cost, loss of subsidy following WSR).

THE END



Presentation 4


Strategic Intentions of the Mining Industry Pertaining to the Water Sector by
Mr. Charles Siwawa- CEO Botswana Chamber of Mines



**WATER PITSO 2014 –
SUSTAINABLE INTERVENTIONS TO
ADDRESS BOTSWANA'S WATER
CHALLENGES**

19th to 20th March 2014 - MAUN

VISION / MISSION



- The Botswana Chamber of Mines was established some 30 years ago with the intention to share ideas and challenges

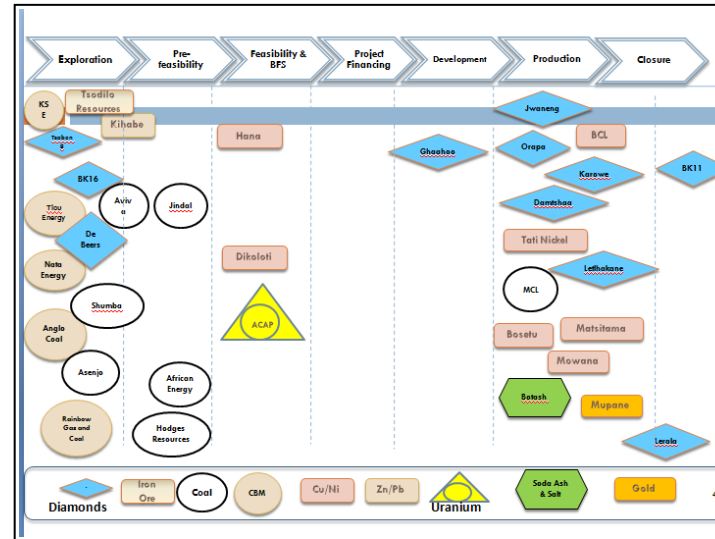
- Vision
 - To be a respected, effective and unified voice for the mining industry that educates and shares knowledge with its stakeholders

- Mission
 - We represent the interest and needs of the mining industry in Botswana

WATER USAGE



- The mining industry remains the largest user of water produced in the country
- There is recognition in the industry that this is a finite resource that is also shared by the rest of the community
- There is continual research on reduction of water usage and the effect on the environment

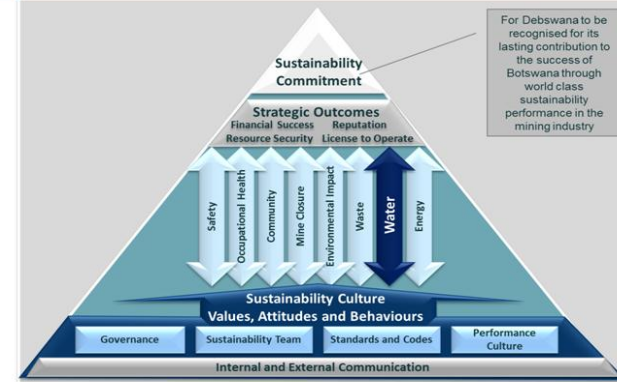


Debswana Water Management: Vision and Mission

- **Vision**
- **“To sustainably supplying water for Debswana’s operations”**
- **Mission**
- **“Secure water resources for sustainable diamond and coal mining while continually reducing new water intake and minimising the impact on the environment, through defined key focus areas”**



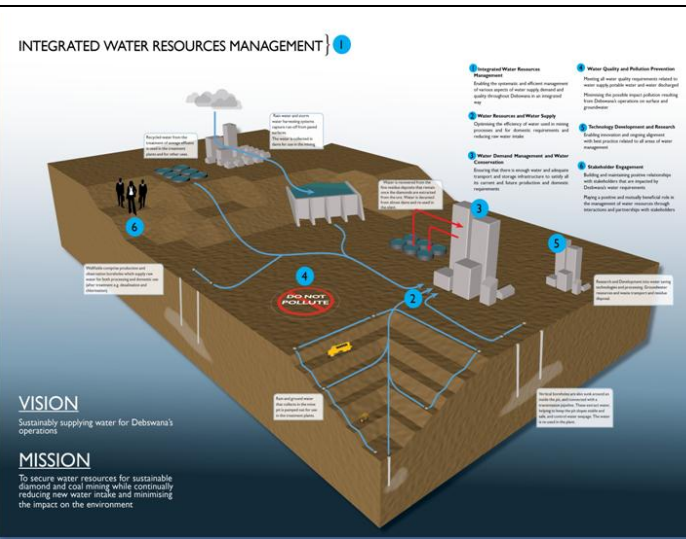
Debswana Water Management Strategy



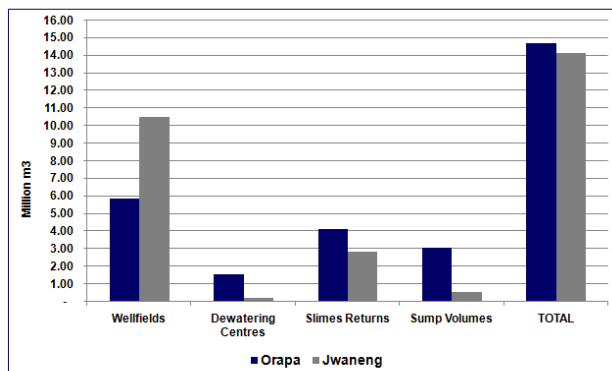
Strategic Focus Areas:



- 1 Integrated water resources management
- 2 Water resources availability - water supply
- 3 Water demand management and water conservation
- 4 Water quality and pollution prevention
- 5 Technology development and research
- 6 Stakeholder engagement



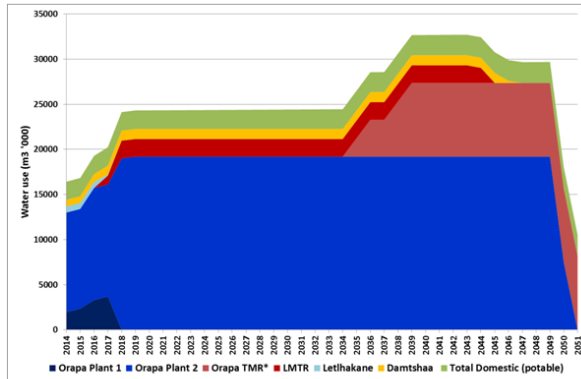
Current Water Supply Breakdown - Operations 2013



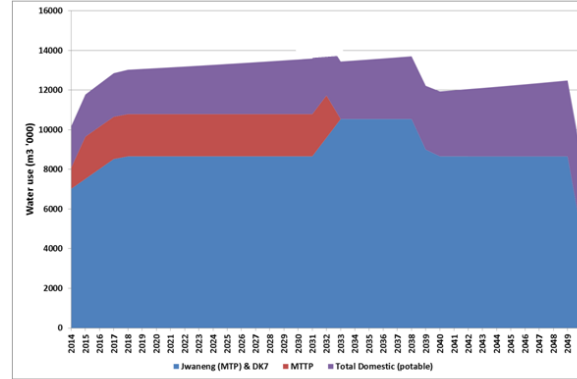
Future Water Requirements – ‘The Burning Platform’



Future Water Requirements: Orapa RDP Alignment



Future Water Requirements: Jwaneng RDP Alignment



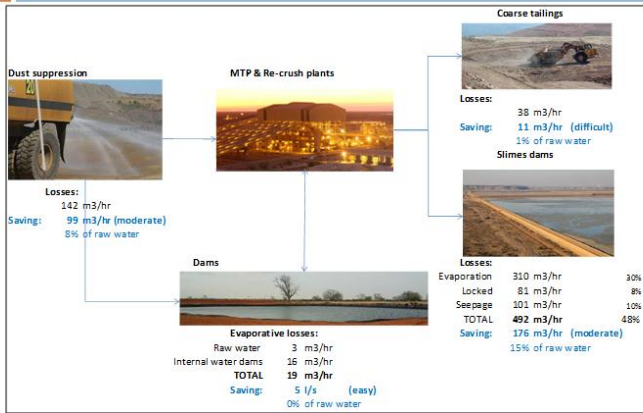
Initiatives (past present)

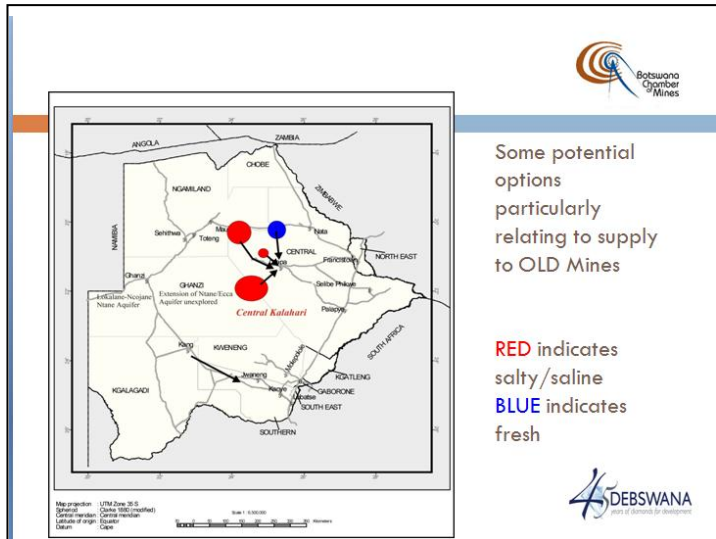


Initiatives	Desired Outcome
Paste thickening 2006 – 2008 Trials! <i>Proved technically challenging & costly</i>	To retain / reclaim process water and produce thick slurry (paste) on disposal
Storm water harvesting -1mil m3 dam at OLD <i>(Implemented BUT on-going investigations)</i> • Seeking to build another dam, 2007 - around current slimes dams @ OLM	Harness 'free' water to reduce new intake from wellfields
Evaporation Studies @ Jwaneng 2006	Reduce losses and overall raw water demand
WETT – Water Efficiency Tracking Tools – Jwaneng Mine, <i>Example</i>	Demonstrate proper accounting of resources (water balance) for focused implementation of actions & research & technology use
Conservations drives, messages, dry gardens, all operations & Corporate Centre <i>(On-going)</i>	Change to a culture of awareness, action oriented, to save to water
Saline water options (Investigations) <i>Since 2007/8</i>	Access 'free' competition resources, reduce fresh water intake by plants
Dry Processing!!!! Key research area <i>(untapped technological advantages)</i>	Effectively reduce water in the ore processes



Water Efficiency Tracking Tools (WETT) - Jwaneng





Low energy Process water treatment: Nickel Removal Plant and constructed wetland

The nickel removal plant uses low energy resulting in less green house gas emissions.
The constructed wetlands treat the water further, it is also a carbon sink

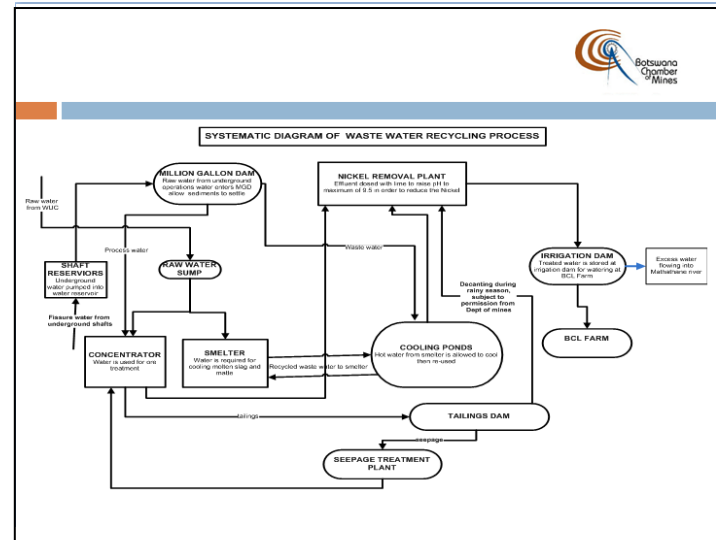
Increased Farm utilization to use up all the Waste water

Farm 210 Hectares

Lucerne

Mango Fruit trees

Treated mine effluent from the irrigation dam used for irrigation at the BCL farm. The farm is a net carbon sink

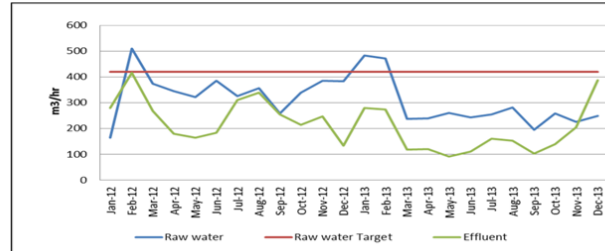


Water re-use



Treated effluent from a sewage trickle filter treatment plant to be used for irrigation at the sports fields (golf, cricket, softball) and landscaping at the BCL recreational centre. Water from this plant is BOBS 93:2012 compliant for release into the environment.

BCL Water management



The use of mine effluent in the Concentrator processes starting February 2013 has also reduced raw water consumption from Water Utilities Corporation. Note: Mar 2013 because of certain interventions we dropped raw water consumption from over 400 m³/hr. to around 250 m³/hr. Increase in effluent due extreme wet weather.

THANK YOU FOR YOUR TIME



Contact:

Charles Siwawa
 Chief Executive Officer
 Botswana Chamber of Mines
 Tel: +267 3914686
 Cell: +267 71315408
 Fax: +267 3914684
 eMail: bcm@info.bw
 Website: www.bcm.org.bw

Presentation 5

Civil Society and Community Participation in Water Resources Management by
Mr. Felix Monggae- CEO Kalahari Conservation Society

**CSO AND COMMUNITY PARTICIPATION
IN THE WATER RESOURCES
MANAGEMENT
Water Pitso – 20-03-2014
Maun Lodge**

KALAHARI CONSERVATION SOCIETY
Felix Monggae



Introduction

What are NGOs?

Non Governmental Organizations (NGOs)- is a term that encompasses a wide range of similar and dissimilar organizations.

NGOs are private and pursue a variety of activities that enhance the general welfare of the communities they serve.

In Botswana they include (INGOs, some CBOs, -CSOs, NGO Networks etc).

NGOs & CBOs = CIVIL SOCIETY

Civil society refers to the set of institutions, organisations and behaviour situated between the state, the business world, and the family.

TRAITS OF CSOs

- clearly defined constituency
- target the poorest of the poor and focus on micro or local level
- participatory approach
- community oriented values
- Sometimes voluntary staff
- Local accountability
- Expertise and advice
- Awareness-raising

CHARACTERISTICS OF CSOs

- they are independent of government and are or aspire to be self-governing
- they rely on voluntary contributions (labor, materials, funds)
- they are non-profit
- they have a service orientation
- they will not be constituted as a political party
- they will not be a criminal or violent group

WHAT ROLES DO CSOs PLAY?

TWIN EXPECTATIONS FROM GOVERNMENT

ACT AS MONITORS OF THE PUBLIC GOOD & SAVEGUARD THE INTERESTS OF THE DISADVANTAGED SECTIONS OF SOCIETY

EXPANDING ACCESS TO SOCIAL AND ECONOMIC SERVICES THAT CREATE JOBS AND ERADICATE POVERTY

SOCIAL WATCH ROLE

SERVICE DELIVERY

-TRANSPARANCY
-ACCOUNTABILITY

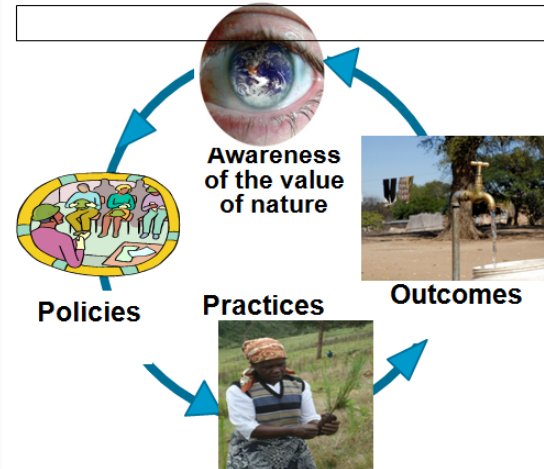
REQUIRES

-COST EFFECTIVENESS
-SUSTAINABLE SERVICE DELIVERY
-GOOD GOVERNANCE

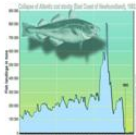
Why CSOs participating in Water Resources management

- **Social expectations & Roles**, Water as social good, promote conservation, IWRM, shortages. etc
- **Economic questions** – management, wise use, sustainability, livelihoods and pricing, etc
- **Promoting the “unheard Voices”** – most vulnerable and marginalised poor communities, human rights issues, stakeholder engagement etc

The development trajectory



Awareness – of the current trajectory attracting CSOs and Community Participation



Fisheries collapse



Water shortages



Climate change impacts



Food insecurity and instability



Ecosystem services declines



Poverty and inequity

PARICIPATORY ROLES

Policy Formulation: There is a marked increase in NGO and community participation policy processes as -invited participants e.g IWRM, Water policy

Agenda Setting: NGOs and Communities sometimes exert pressure from outside “the tent” on both formulation and implementation of policies, programmes and plans

Service Deliverers: NGOs engage with policy makers at implementation or field/ Action level. play a bridging role between government and the people (e.g ERP and SAREP projects)

Watchdog/Monitors: NGOs are providing an independent assessment of how public policy is implemented

Roles contd

Innovators/Research: NGOs are sometimes instrumental in the introduction of new approaches and techniques which, when adopted bring considerable benefits to the poor.

As Partners: NGOs are working in partnership with Governments and Donors in the planning process by offering expertise, experience and where possible logistics and other resources.

- E.g Promotion of rainwater harvesting, Treatment and reuse of waste water, demonstrate and encourage water conservation methods
- Protect traditional water sources in villages

Future Engagements

Continue participation in networks and collaboration with Government and other sectors on three levels:

- **Community:** enhance capacity to partake in decision making e.g. Conservation committees, CBOs, Water Resources Board, watchdog
- **Researchers:** increase interaction with communities/ feedback, water conservation methods
- **Service providers/ CSOs:** Increase cooperation with government to ensure participation of all sectors and implement water sector priorities e.g. IWRM /WE plan, fundraise

CONCLUSION

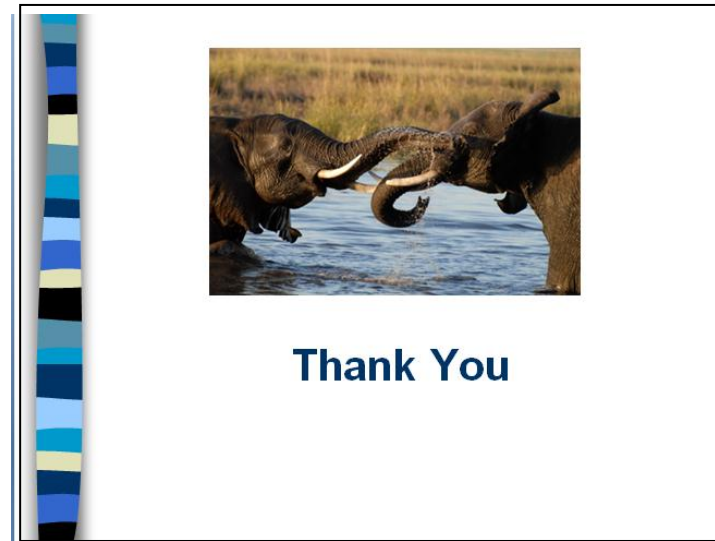
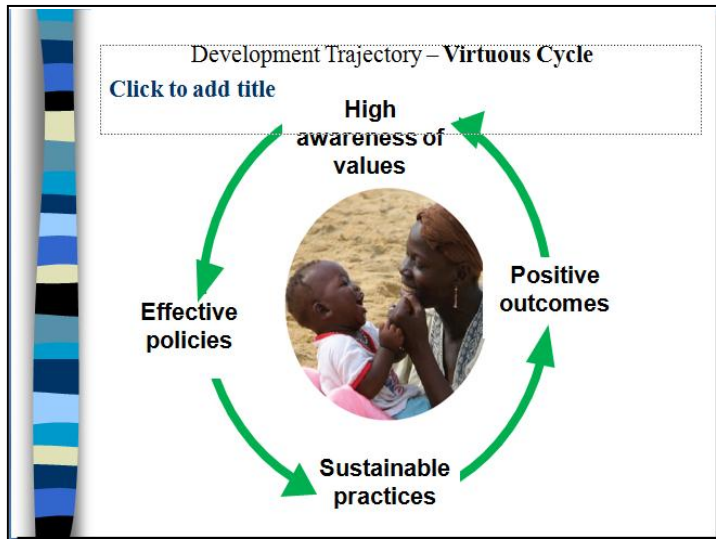
Stakeholders in Botswana have indicated constructive engagement with the water sector during the development of the IWRM/WE plan and we encourage further engagements particularly on 'rights' 'sanitation' and 'water pricing' issues fulfil our international obligations - where possible.

RE A LE AKGOLA...

Development Trajectory – Vicious Cycle

Click to add title





Thank You

Presentation 6
Water Accounts by
Dr. Jaap Arntzen

Water Pitso 2014
 “Sustainable intervention to address Botswana water challenges”

The Botswana Water Accounting Project
 Prepared by Department of Water Affairs and Centre for Applied Research






Why Natural Capital Accounting (NCA)?

- > A *tool* for managers of the economy to allocate scarce, strategic resources more efficiently
- > Closely *linked* to 2013 IWRM-WE plan and the Water Policy
- > Also commitment of Government under **Gaborone Declaration on Sustainability** in Africa
- > How?
 - by providing information missing in national economic accounts (e.g. depletion of groundwater resources)
 - Provides information required by government for optimal use of its natural capital

• “What we don’t measure, we can’t manage”

Water accounting in Botswana

- Prioritised at the 8th BEAC meeting as part of the natural capital accounting-WAVES partnership between Government of Botswana and World Bank; reported to BEAC ever since;
- Water accounts record on an annual basis the stock of water resources and their use in the economy through **stock and flow accounts**.

WAVES water accounting

- **Phase 1 (Sept- Nov 12)** focused on flow accounts;
- **Phase 2 (Jan – June 13)** expand the accounts & build WA-capacity at DWA;
- **Phase 3 (July 13 – 2015):**
 - ✓ Institutionalisation of the accounts at DWA;
 - ✓ Updating and expansion of accounts;
 - ✓ Incorporation of WA based policy recommendations in NDP11 cycle and implementation of IWRM-WE Plan and Water Policy.

POLICY IMPLICATIONS

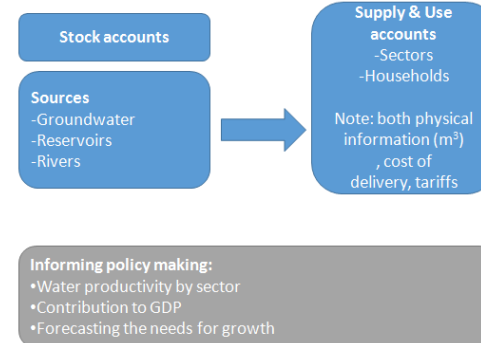
- The ultimate aim is to ensure that the findings are fully integrated in water management and development planning
- Five main policy messages
 - There is an urgent need to increase water use efficiency;
 - There is an urgent need to allocate water to most deserving sectors and uses;
 - People's basic water needs, ecological water requirements (EWR) and water requirements of strategic sectors need to be safeguarded;
 - Water bills need to be kept affordable; and
 - Data need to be better collected and analysed to contribute to informed decision making.

Concluding remarks

- WA will become an on-going activity;
- DWA will lead through a WA unit but requires significant support from WUC, SB, MoA, Mines etc;
- Move from 'project' to key government activity;
- Results and policy recommendations need to be incorporated in NDP11 preparations.

Findings for Botswana's Water Accounts

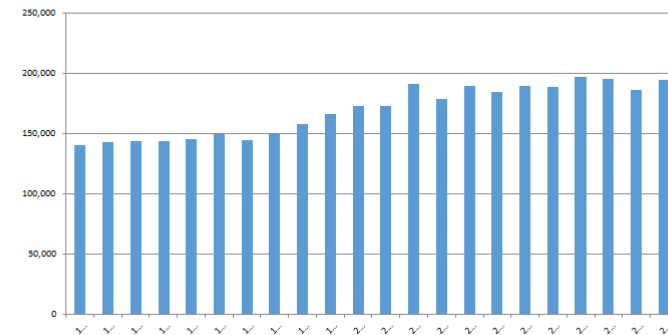
The example of water accounts



Reservoir water availability indicators

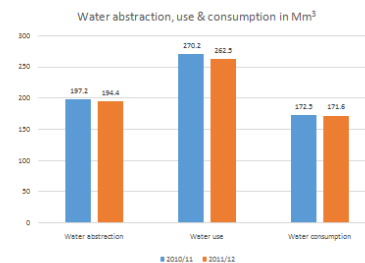
- Water storage capacity in reservoirs (2010/11 & 2011/2): 422 Mm³
- Safe yields from reservoirs (2010/11 and 2011/12): 73.5 Mm³
- Safe yields as % of storage capacity: 17.4%
- Water storage capacity per capita (2011/12): 522 L/p/d
- Safe yield storage capacity per capita (2011/12): 96 L/p/d
- Storage capacity as % of internal run off: 24%

Long term trend in fresh water abstraction (000 m³)



Abstraction, use and consumption

- Water *abstraction* exceeds consumption due to losses
- Water *use* exceeds abstraction because of intermediate use by WUC
- Water *consumption* is lower than use because of:
 - Elimination of intermediate use
 - Return flows

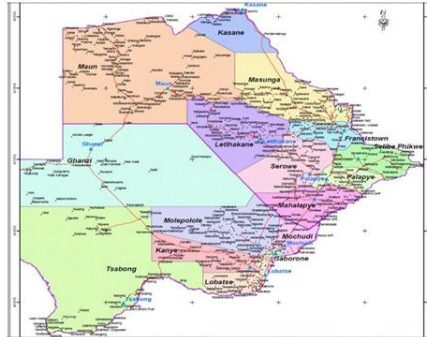


Water abstraction indicators

- Total water abstraction per year (Mm³)
 - 2010/11 197.7
 - 2011/12 194.4
- Abstraction (2011/12) from:
 - Groundwater (Mm³) 103.4
 - Surface water (Mm³) 91.0
 - Reservoirs 75.6
 - Rivers 15.4
- Abstracted for own use (2011/12) Mm³ 103.4
- Abstraction for distribution (2011/12; Mm³) 90.9
- Water use (2011/12):
 - Domestic water use p.c. (2011/12): 50.4 L/day/person
 - Total water use p.c.: (2011/12): 266.6 L/day/person

Need for sub regionalisation

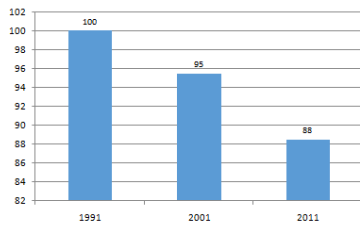
- Water Policy and IWRM-WE Plan advocate for decentralised water resource management
- What are the most appropriate water regions?
 - E.g. river catchments, aquifers, transboundary basins.
- Need for reconciliation of water regions with other spatial classifications
- Planned for analysis, debate & decision in 2014/15



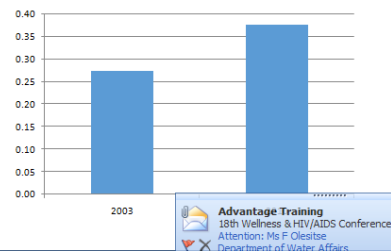
M/C	2010/11						2011/12						
	Service providers			Self providers			Service providers			Self providers			
	WUC	DWA	DCs	Mines	Livestock	Total	WUC	DWA	DCs	Mines	Livestock	Total	
Maseru	3,191.2	-	-	-	650.0	5,448.9	9,290.1	5,565.4	-	-	895.6	5,448.9	11,709.8
Letlhekane	10,507.1	-	-	-	2,793.7	13,300.8	9,617.7	-	-	-	-	2,793.7	12,411.4
Mochudi	2,879.7	-	-	-	1,963.7	4,843.4	3,291.3	-	-	-	-	1,963.7	5,255.1
Serowe	23,851.5	-	-	-	374.8	24,226.3	25,820.5	-	-	-	-	374.8	26,195.3
Palapye	852.2	-	-	-	77.5	3,507.1	4,436.8	2,172.6	-	-	69.5	3,507.1	5,749.3
Mahalapye	1,902.6	-	-	-	7,269.2	9,171.9	4,727.1	-	-	-	-	7,269.2	11,996.3
Kaseribe	606.6	-	-	-	698.3	1,304.9	1,147.3	-	-	-	-	151.1	1,298.4
Francistown	13,117.1	-	-	-	3,498.7	16,615.8	12,538.6	-	-	-	-	3,498.7	16,037.3
Selibe Phikwe	1,829.8	-	-	-	2,740.0	3,368.4	7,938.3	7,743.3	-	-	3,152.4	3,368.4	14,264.1
Tsabong	-	230.5	-	-	1,219.3	1,449.9	403.0	-	-	-	-	1,283.5	1,686.5
Molepolole	188.2	3,098.3	-	-	6,983.7	10,270.2	4,357.9	-	-	-	-	7,351.2	11,709.1
Kanye	70.2	3,817.8	-	-	7,961.9	4,062.9	15,912.8	3,570.3	-	-	7,106.5	4,276.8	14,933.6
Serowe	-	1,960.8	-	-	2,143.8	4,104.6	2,629.7	-	-	-	-	2,143.8	4,773.6
Letlhekane	-	655.3	-	-	13,738.3	2,365.7	16,759.3	681.4	-	-	16,209.1	2,365.7	19,256.2
Ghanzi	-	644.0	-	-	4,761.7	5,405.7	865.2	-	-	-	-	5,012.3	5,877.5
Maun	-	1,957.1	-	-	5,015.0	6,972.1	-	1,738.1	-	-	1,675.0	4,665.8	8,078.9

Decoupling population and economic growth from water abstraction

Water use per person fell 12% from 1991 to 2011 (index 91 = 100)



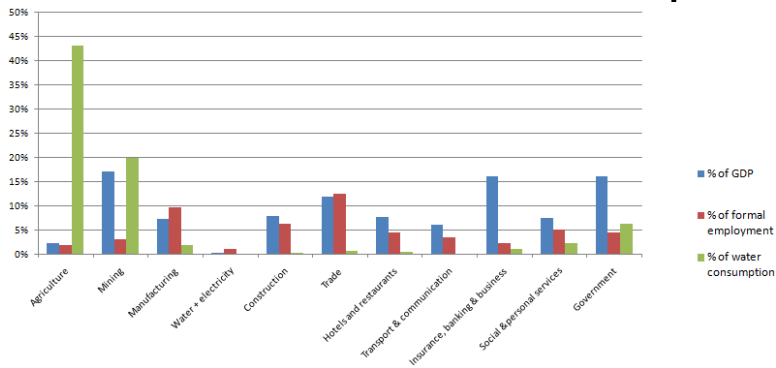
Water productivity is increasing (Pula of GDP/m³ water)



Water use efficiency indicators

- Value added/ m³ (constant 2006 BWP)
 - 2010/11: 337.09
 - 2011/12: 369.41
- Formal employment (jobs/000 m³)
 - 2010/11: 2.3
 - 2011/12: 2.3
- Formal & traditional employment (jobs/ 000 m³)
 - 2010/11: 3.5

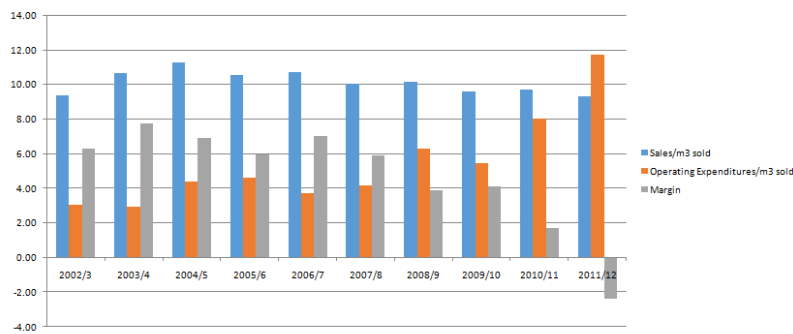
Is our water allocation sustainable & optimal?



Allocation issues: potable and non-potable resources

- Current situation with waste water:
 - Estimates only (over 30 Mm³?); inflows & outflows not measured
 - Amount growing fast due to expansion sanitation infrastructure and higher living standards
 - Less than 10% of est. treated wastewater re-used against NMPWWS target is 96% in year 2030.
- Allocations depend on local situation.
 - Mining & construction sectors:
 - Use of non-potable water for processing (saline or wastewater)
 - Irrigation:
 - Use of treated wastewater

Negative trend in WUC unit revenues and operating expenditures (2003/4 – 2011/2; BWP/m³)

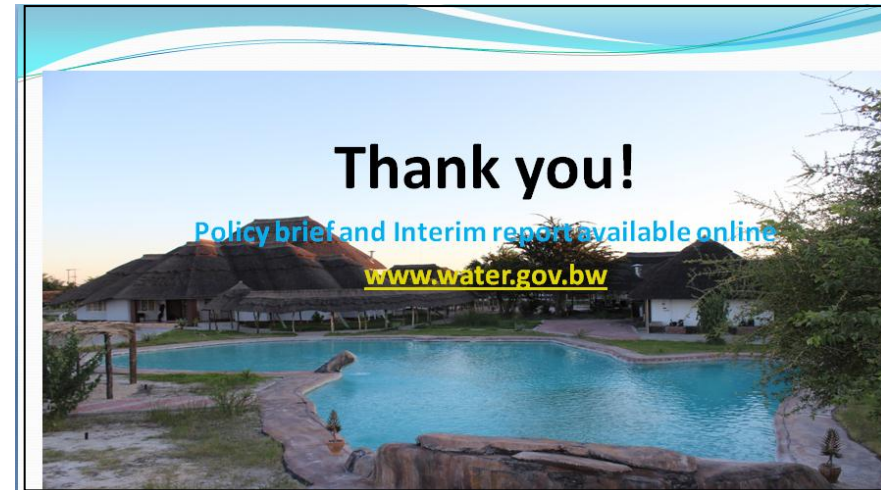


Need for improved data in support of IWRM & development planning

- More attention & data for self providers:
 - Mines: abstraction, use and consumption figures in annual reports to WAB
 - Data template
- WUC:
 - water data for smaller settlements
 - Consumption by economic sectors
- Better reservoir data
- Irrigation:
 - Meters for water abstraction and use
 - Better designed irrigation systems
 - Data collection template
 - Use of treated wastewater

Water Accounts and the Water Sector Reform Programme

- WSRP has important potential advantages for WA and IWRM. These include:
 - Accounting of water consumption in all settlements
 - Accounting for wastewater inflows and outflows;
 - Greater simplicity and transparency of supply (i.e. only one water service provider);
 - Explicit water resources management mandate for DWA.
- WA results show that the reforms currently pose problems:
 - Data gaps, incompatibilities and discrepancies;
 - Renewed focus on supplying water ('keep it flowing') instead of shifting towards WDM;
 - Rising supply costs?



ANNEX 5

2014 Water Pitso Programme

2014 WATER PITSO - PROGRAMME

(DAY 1 20/3/14)(MASTER OF CEREMONY- DR. O T. OBAKENG - DWA)

0800	-	0830	Registration
0830	-	0833	National Anthem
0833	-	0835	Prayer
0835	-	0840	Introduction (DC- Ms. Bernadette Malala)
0840	-	0845	Welcome Remarks (Kgosi Kealetile Moremi)
0845	-	0905	Official Opening (Hon Minister of Minerals, Energy & Water Resources, M.P Mr. Onkokame Kitso Mokaila)
0905	-	0915	Purpose of Pitso (Permanent Secretary-MMEWR)
0915	-	0925	Presentation (last year's resolution) - Ms. B. Mathangwane-Deputy Director (DWA)
0925	-	0940	Presentation 1 :(Meteorology) – Ms. Dorcus Masisi (Principal Metereologist) <i>Climate change impacts on water resources Availability & possible interventions.</i>
0940	-1000		Presentation 2: <i>Key Challenges & interventions to water supply in Botswana.</i> (Mr. G. Senai - Director Infrastructure, WUC)
1000	-	1015	Discussions & Resolutions (Presentation 1 & 2)
1015	-	1045	TEA BREAK

(MASTER OF CEREMONY- MR. K. KEREKANG – Energy Director)

1045	-	1105	Presentation 3 (Botswana Chamber of Mines) CEO – Charles Siwawa Topic: <i>Strategic intents of the mining industry pertaining to water sector.</i>
1105	-	1115	Presentation 4: Civil Society Community Participation – CEO KCS Felix Monggae.
1115	-	1200	Presentation & discussion (Water Accounts by DWA/WAVES)
1205	-	1245	Discussions (All)
1245	-	1400	LUNCH
1400	-	1500	Group work
1500	-	1530	TEA BREAK
1530	-	1700	Group work continues

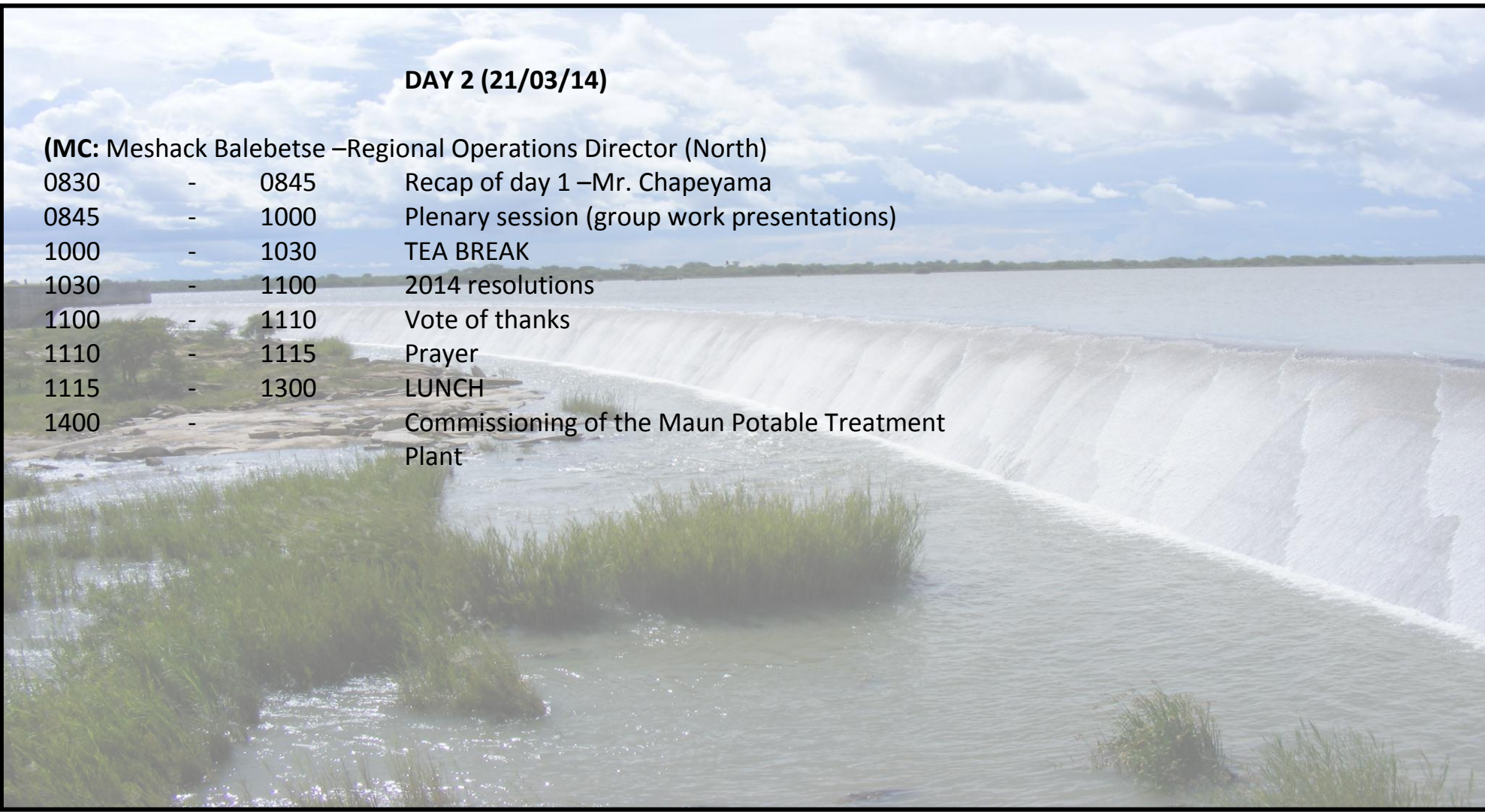
Groups

Topics

1. Policy & legislation
2. Technology
3. Civil Society Community
4. Environment

Facilitator

- DPS-Energy and Water -Mr. K. Abi
Ag. DPS-Project Management Office- Mr. T. Dedede
Participation CEO-KCS-Mr. F. Monggae
Director-DEA-Ms. Portia Segomelo



DAY 2 (21/03/14)

(MC: Meshack Balebetse –Regional Operations Director (North)

0830	-	0845	Recap of day 1 –Mr. Chapeyama
0845	-	1000	Plenary session (group work presentations)
1000	-	1030	TEA BREAK
1030	-	1100	2014 resolutions
1100	-	1110	Vote of thanks
1110	-	1115	Prayer
1115	-	1300	LUNCH
1400	-		Commissioning of the Maun Potable Treatment Plant

ANNEX 6

LIST OF PARTICIPANTS: 2014 WATER PITSO

LIST OF PARTICIPANTS: 2014 WATER PITSO

NO	NAME	ORGANIZATION	TELEPHONE	EMAIL ADDRESS
1	M.E. Macheng	MMEWR	71636718	memacheng@gov.bw
2	D.T Motsumi	WUC-Palapye	71306690	dmotsumi@wuc.bw
3	N Mbayi	WUC-Gaborone	71309746	nmbayi@wuc.bw
4	M. Balebetse	WUC-Operations North	72112216	mbalebetse@wuc.bw
5	M. Monthe	WUC-Maun	71629711	mmonthe@wuc.bw
6	K. Abi	MMEWR	3656647	kabi@gov.bw
7	S. Moreri	BPC	75419496	spencerm@bpc.bw
8	M. Rapalai	MMEWR	72463599	mrपालai@gov.bw
9	E.O Mathumo	WUC-Selebi Phikwe	71250371	emathumo@wuc.bw
10	W.M. Petje	BPS	73312586	wpetje@gov.bw
11	S.M Tiro		73914013	smtiro@go.bw
12	O. Sebegu	CEDA	72328911	osebegu@ceda.co.bw
13	Maggie. M. Mokgadi	MMEWR	74248634	mmmokgadi@gov.bw
14	R. Maboko	MLG	71339129	rmaboko@gov.bw
15	Map Ives	HATAB/Wilderness Safaris	71658686	mapi@wilderness.co.bw
16	Lt. Col L.T. Mogorosi	BDF	76212944	
17	Bathusi Segobai	MFDP	71975138	bsegobai@gov.bw
18	Lt. Col. Kopi	COE-BDF	76212543	ddkopi@yahoo.co.uk
19	Steven Ramontsho	WUC-Gaborone	76207568	sramontsho@wuc.bw
20	B. Jay	Water Board	77017152	baraedij@yahoo.com
21	T. Moncho	Dept of Tourism	6860294	temonco@gov.bw
22	E. Mmolai	Dept of Information	6860294	emmolai@gov.bw
23	O.B. Mampane	DWA-Tsabong	73333421	obmampane@gov.bw
24	D.S Matoto	MoA	3689365	dmatoto@gov.bw
25	J.S. Wellio	BOCCIM	6860322	jswellio@gmail.com
26	R. Letsatle	WUC-F/Town	71450649	rletsatle@wuc.bw
27	G. Kwenaemang	Ngami Times	72324854	Limo.k2013@gmail.com
28	M. Mmipi	WUC-Gaborone	71324854	mmmipi@wuc.bw
29	F. Monggae	KCS	71312447	ceo@kcs.org.bw

30	M.Rhankudu	Prisons	6860241	
31	A.Mooka	WUC-Masunga	76089280	ammoka@wuc.bw
32	M.C. Diswai	Ministry of Health	3632477/71573268	mdiswai@gov.bw
33	B. Kholi	Gabz FM	73632144	brightkholi@gmail.com
34	O.B. Pule	DWA-Gaborone	76329034	obpule@gov.bw
35	S. Nkala	DWA	71741725	spnkala@gov.bw
36	T. Gasefele	Police	71712608	
37	G. Thabeng	DWA-Gaborone	74666340	gthabeng@gov.bw
38	B. Morokotso	Sunday Standard	71477733	basadimorokotso@yahoo.com
39	O.T. Mbulawa	WUC	71319734	ombulawa@wuc.bw
40	M. Masire	Diamond Hub	71303173	mmasire@gov.bw
41	G. Ramoshibidu	DWA Ghanzi	73333420	
42	Dorcas Masisi	DMS	3612249	dmasisi@gov.bw
43	Gosalamang Ditiro	MMEWR	74596969	gsditiro@gov.bw
44	Aaron	MMEWR	3640200	
45	B. Letsholathebe	DWA Gumare	6874029	bletsholathebe@gov.bw
46	T.G Dedede	MMEWR	366667	tdedede@gov.bw
47	T.S. Molefi	MMEWR	3656670	trsmolefi@gov.bw
48	Geoff Khwarae	SAREP	71616121	gkhware@sarep.co.bw
49	Mpho Therego	BTV	6864381	
50	M. Marumo	Water Surveys	71315414	marumo@watersurveys.co.bw wsb@it.bw
51	C. Siwawa	Botswana Chamber of Mines	71315408	Charles@bcm.org.bw
52	H. Chimbombi	Dept. of Mines	72156215	mchimbombi@gov.bw
53	L.Mogalabwe	Mabudutsa Kgotla	75663273	Leatilekealositse-mogalabwe@yahoo.com
54	M. Madongo	Tawana Land Board	71678519	mamalepe@gmail.com
55	Vincent Kinnear	DWA-Gaborone	360715/7333326	vkinnear@gov.bw
56	Dennis Thomas	MMEWR	3656653/72285676	dthomas@gov.bw
57	Tapson Bombo	DWA-Kasane	6250323/73333250	tbombo@gov.bw
58	Cedric Mpedi	A-CAP Resources	71300665	cmpedi@a-cap.com
59	Mandu Tsholofelo	BURS	71680902	ktsholofelo@burs.org.bw
60	Jaap Arntzen	CAR	3903401/72141259	jarntzen@car.org.bw

61	L.L. Molatlhegi	MMEWR	3656607/72338357	lmolatlhegi@gov.bw
62	Thabo Morake	BCL	71798282	tmorake@bcl.bw
63	Anthony Hlokomayo	BMC	72138138	ahlokomayo@bmc.bw
64	Philip Searobi	BDF	3667625	phillipsearobi@yahoo.com
65	G.K. Kehuparetse	WUC-Letlhakane	71309769	gkehuparetse@wuc.bw
66	E.Mmerekhi	Gender Affairs	6597225	Emmzal09@yahoo.com
67	L. Thamae	ORASECOM	+27-12-6636826	Lenka.thamae@orasecom.org
68	K. Mayano	Chair- Tawana Land Board	73807678	
69	M. Keitseope	Dept. Of Energy	73380113	mkeitsepe@gov.bw
70	F.M Radifalana	Tawana Land Board	73209296	fradifalana@gov.bw
71	C. Cotzee	Tawana Land Board	68720215	ccotzee@gov.bw
72	S. Makwanga	Tawana Land Board	71390897	
73	T.H. Ngwisanyi	DGS	5330428	tngwisanyi@gov.bw
74	G. Senai	WUC-Gaborone	75503325	gsenai@wuc.bw
75	K. Venjonoka	Dept. Of Energy	73553481	kvenjonoka@gov.bw
76	O. Chapeyama	Enviroplan	72106588	ochapeyama@enviroplan.co.bw
77	T. Jenamo	BTV	6864381	jenamot@yahoo.co.uk
78	S. Pelaelo	Prisons Boro	72731905	Spelaelo@octava.59
79	K. Kerekang	DoE	71726521	kkerekang@gov.bw
80	W.M Ngubula	DWA-Maun	71900449	wngubula@yahoo.com
81	Banda Maswabi	DEBSWANA	71309486	bmaswabi@debswana.bw
82	Teddy Ditsabatho	WUC-Gaborone	71304884	tditsabatho@wuc.bw
83	Harold Melaetsa	MMEWR	74341890	omelaetsa@gov.bw
84	Innocent Leonard	WUC-Serowe	71305559	ileonard@wuc.bw
85	Kenny Labane	WUC-Lobatse	71306662	klabane@wuc.bw
86	K. Machete	WUC-F/Town	74501204	kmachete@wuc.bw
87	Boitumelo Kgaodi	WUC-Moelopolole/Mochudi	71305922	bkgaodi@wuc.bw
88	Kene Dick	DWA	73333243	kdick@gov.bw
89	Moremi Phiri	MMEWR	71310121	mophiri@gov.bw
90	Joseph Monggae	WAB	71603502	joseph@gscs.co.bw
91	Jacob Thamage	MMEWR	72409092	Jthamage@gov.bw
92	O. Obakeng	DWA-Gaborone	73333227/3607201	oobakeng@gov.bw
93	Bogadi Mathangwane	DWA-Gaborone	73333229/3607202	bmathangwane@gov.bw
94	A.G. Kago	DWA-F/Town	73333249	gakago@gov.bw

95	Michael Sepepe	WUC-Maun	73383530/71319769	msepepe@wc.bw
96	Tefo Lobelo	DWA-Gaborone	71313001	tlobelo@gov.bw
97	Portia Segomelo	DEA	71631693	psegomelo@gov.bw
98	O. Melaetsa	MAD	74341890	omelaetsa@gov.bw
99	G.W. Motsumi	WUC-Gumare	71319768	Gwmotsumi@wuc.bw
100	L. Molonda	NWDC	71403956	lmolonda@gov.bw
101	Gape Raletano	WUC-Maun	71446941	graletano@wuc.bw
102	Phemo Kgomotso	UNDP	3633711	phemokgomotso@undp.org
103	E.Segosebe	WAB	71736437	segosebe@mopipi.ub.bw
104	Koketso Rabosigo	Tribal Affairs	71890295	
105	Petros Mosholombe	BPC	71664987	masholombep@bpc.bw
106	C. Brooks	SAREP	71371623	cbrooks@sarepmaun.com
107	Harity Kruger	World Bank	71330991	ckkruger@worldbank.org
108	Ebenizario Chonguica	OKACOM	6800023/71342241	ebenc@okacom.org
109	Khumo Ketlhwatsebe	Tawana Land Board	72513149	Khumo2@gmail.com
110	Khotso Sebeke	DWMPC	6801244	kcsebeke@gov.bw
111	G.T. M. Moanakwena	DWA-Gaborone	3607140	gmoanakwena@gov.bw
112	Olebeng Balapi	DWA-Maun	6860452	obalapi@gov.bw
113	Mbaki Mmolawa	Discovery Metals	72305806	Mbaki.mmolawa@discoerymetals.com
114	Michael Knott	Discovery Metals	72323050	michael.knott@discoverymetals.com
115	Johnny Maruda	Discovery Metals	72307134	Johnny.maruda@discoverymetals.com
116	Prinsloo Shashe	Tribal	71616366	
117	Rejoice Tsheko	BCA	72168004	Rejoice.tsheko@gmail.com
118	Palagangwe Koorutwe	DWA Mahalapye	4710251/73333247	pkoorutwe@gmail.com
119	Phatsimo Chabage	WUC	71351833	p.chabage@wuc.bw
120	Lorato Moseki	GS	71650421	lmoseki@gov.bw
121	KhumoitsileMmolawa	BCA	74514631	kmmolawa@bca.bw
123	M Rapalai	MMEWR	72463599	mrपालai@gov.bw
124	Tsholofelo Otukile	Tawana Land Board	6860292	tsotukile@gov.bw
125	Leungo Mompoti	Tawana Land Board	6874030	lmompoti@gmail.com
126	Aupa Mokotedi	Broadcasting Services	6864381	apmokotedi@yahoo.co.uk
127	Kethuse Puso	Gender Affairs	6865617	ktpuso@gov.bw
128	C.R. Tamaki	Education	71580749	otamaki@gov.bw
129	Moatlhodi Phetogo	Dept. Of Youth	6862136	

130	Peter Thorneycroft	Water Africa	71306484	waterv@info.bw
131	Babinang Majatsie	Farmer	71736560	
132	Livingstone	The Patriot	72397103	livingstoneiam@gmail.com
133	Tshepo Thobogang	MMEWR	73187328	tthobogang@gov.bw
134	Katlego Mamonyane	Ghetto Artists	72122139/241659	ghettoartists@yahoo.co.uk
135	Saone Bikitshane	Ghetto Artists	74431625/241658	ghettoartists@yahoo.co.uk
136	Selebogo Seganabeng	BMO	77178676/6862782	sseganabeng@bmc.bw
137	Thato Seth Setloboko	DWA-Gaborone	73609997/3607231	tssetloboko@gov.bw
138	Namu Mangisi	DWA-Gaborone	73333244	nmamgisi@gov.bw
139	Filicia K. Olesitse	DWA-Gaborone	71417921/3607256	folesitse@gov.bw
140	Kealeboga Kolagano	DWA-Gaborone	71646960	kkolagano@gov.bw
141	Maipelo Molebatsi	DWA-Gaborone	73329350	mhmolebatsi@gov.bw
142	T. G Habano	NWDC		
143	Lodulo Matome	BPC		matomeL@bpc.bw

2014 WATER PITSO IN PICTURES



Minister of Minerals, Energy and Water Resources -Hon Onkokame Kitso Mokaila, MP



Mr. Felix Monggae-CEO Kalahari Conservation Society



Mr. Gaselemogwe Senai- Director- Infrastructure, Water Utilities Corporation



Mr. Kgomotso Abi-MMEWR DPS Water and Energy



Mrs. Bogadi Mathangwane-Deputy Director- Department of Water Affairs



Dr. Jaap Arntzen- Water Accounts-Centre for Applied Research



Ms. Dorcus Masisi-Department of Meteorological Services



Ms. Portia Segomelo-Director of Environmental Affairs



The mining industry which is currently booming also formed part of the Pitso



Mr. Banda Maswabi-Debswana



Left: Kgosi Kealetile Moremi
Right: District Commissioner Ms. Bernadette Malala



Left: Hon T. G. Habano-MP Ngami
Right: Hon L. Molonda North West Council Chair



Mr. Charles Siwawa- CEO Botswana Chamber of Mines



Dr. Obolokile T. Obakeng-Director Department of Water Affairs



Participants



Group discussion